OCTOBER 3, 1936

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Railway Age

Founded in 1856

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COMING EVENTS CAST THEIR SHADOW 1945

. . . *Use*
WROUGHT IRON
for Cross-over
Air Brake Piping

● With the ICC ruling that all freight cars must be equipped by 1945 with the new type AB air brake, comes a renewed appreciation of wrought iron.

The bends encountered in fabrication, the vibration encountered in service for the cross-over air brake lines prove too much for pipe that is not genuine wrought iron. Byers Wrought Iron pipe offers the ductility that permits easy forming and uniformity even in severe bends — it does not spring back. Strains are not set up that cause premature failures from crystallization in service. Furthermore, wrought iron lasts longer under corrosive conditions.

Briefly, these facts, backed by experience, are sufficient justification for the use of wrought iron pipe in air brake cross-over lines. Illustrated is one of 2000 cars now being built by the Norfolk & Western Railway on which Byers Wrought Iron is being used.

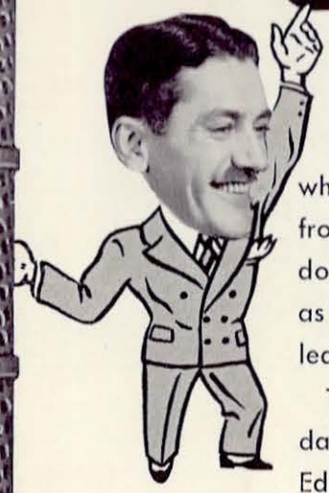
For more instances of wrought iron's resistance to corrosion and vibration, in railroad service, ask a Byers Engineer or write our Engineering Service Dept. A. M. Byers Co. Est. 1864. Pittsburgh, Boston, New York, Philadelphia, Washington, Chicago, St. Louis, Houston.

BYERS GENUINE WROUGHT IRON PRODUCTS

PIPE · WELDING FITTINGS · RIVETS · SPECIAL BENDING PIPE · O.D. TUBES
PLATES · SHEETS · CULVERTS · FORGING BILLETS · STRUCTURALS · BAR IRON

Specify Byers Genuine Wrought Iron Pipe for resistance to corrosion and fatigue and Byers Steel Pipe for your other requirements

"THEY'RE LOCKED IN STEEL— FOR LIFE!"



There isn't any great mystery why Edison Batteries don't fail unexpectedly during a run... why their performance is accurately predictable from car-shopping to car-shopping...why they seldom need repairs...why they live two to five times as long as ordinary batteries...why they cost the least per year.

There isn't any more mystery about it than why day is light and night is dark. The characteristics of Edison Batteries are entirely different from other batteries. All other batteries made in U.S.A. are lead-acid. Edison alone is steel-alkaline. That means that the active materials of the Edison are actually locked in steel tubes and pockets—for the life of the battery—and they can't get out. (It is loss of active materials that shortens battery life—causes battery trouble.) And, in an alkaline battery like the Edison, there is no sulphation because there is no acid.

The hard service batteries have been getting in the last few years has been showing up the real differences in battery performance. Doubtless that is why Edison is going ahead so much faster than the field as a whole.

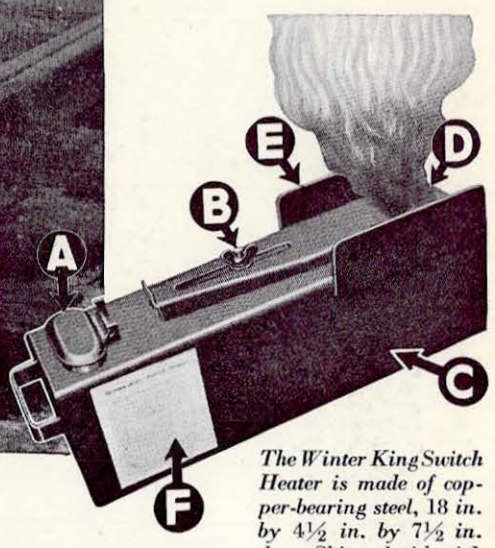
EDISON
STORAGE
BATTERY

DIVISION OF
THOMAS A. EDISON, INC., WEST ORANGE, NEW JERSEY

Published weekly by Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter January 4, 1933, at the Post Office at Philadelphia, Pa., under the Act of March 3, 1879.

The time to lick Blizzards is before they come

Sixteen inches of snow in 1½ days didn't bother the switches at one large terminal where 4000 Winter Kings were burning.



The Winter King Switch Heater is made of copper-bearing steel, 18 in. by 4½ in. by 7½ in. deep. Shipped with wick in place, ready for immediate installation.

install Winter Kings now

WINTER King Switch Heaters are an inexpensive, efficient way of keeping switches clear of ice and snow. They fit under the switch, between the ties—six to eight heaters per switch. They use kerosene—each holds enough for 9 to 15 hours of burning.

Install them now, before cold weather sets in; light them up whenever snow threatens and extinguish when weather is clear again (one man can take care of about 100 heaters); take them up and store them when spring finally arrives. They will be serviceable for years to come. Compared to manual snow removal, they will save each winter much more than their original cost plus operating expense. They will keep switches open in the coldest weather, the severest storms. Order now from any Bethlehem district office—don't wait until the first snow falls. Delay may be too expensive.

A Fuel opening, self-closing cap. May be filled while burning.

B Heat may be regulated as needed by shifting adjustable cover.

C Fuel capacity, 1½ gal. of kerosene—enough for 9 to 15 hours of burning.

D Large wick opening; heat flows around points and stock rail.

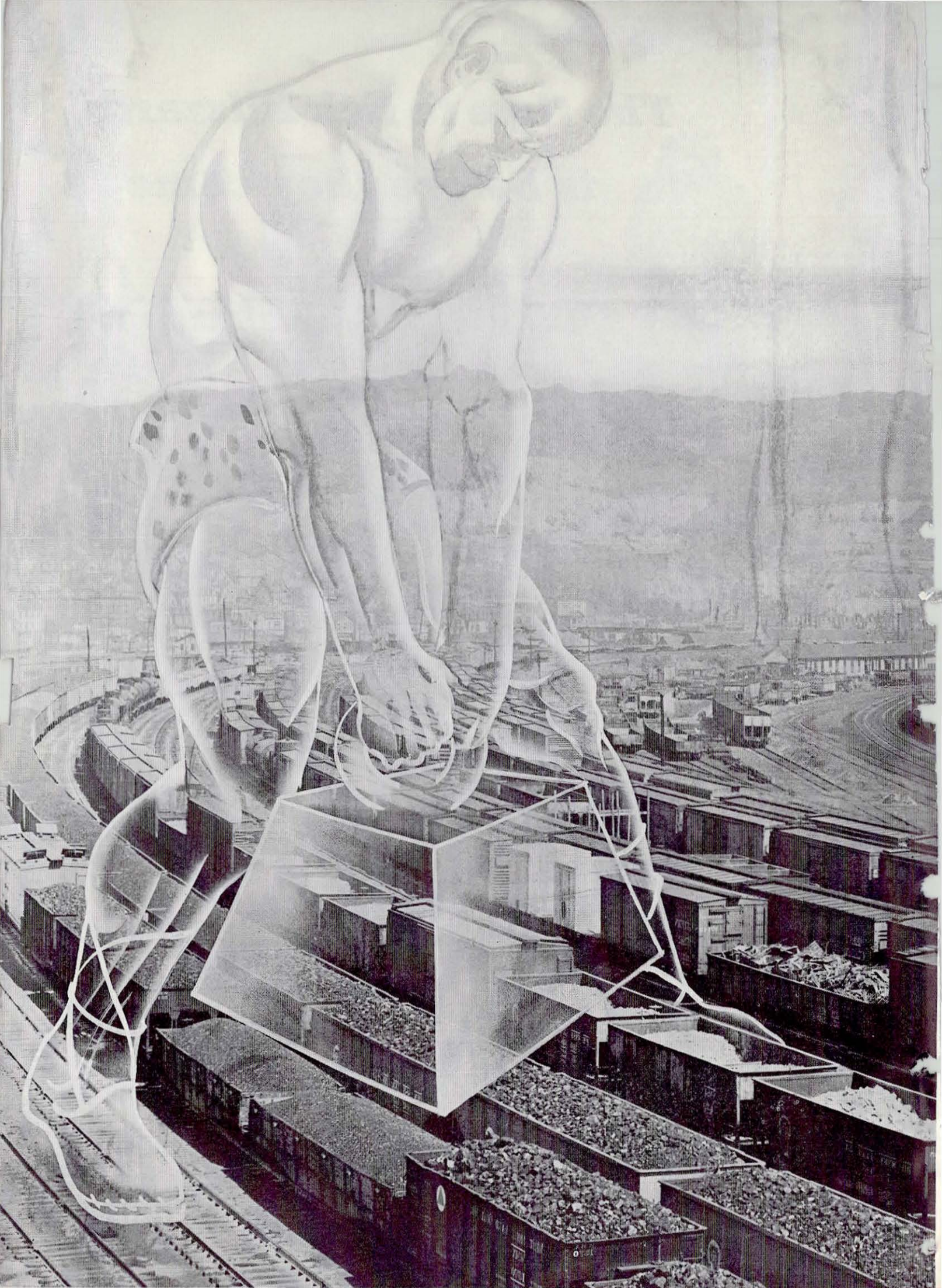
E Flange fits up against rail—protects ties from heat and regulates height of heater.

F Complete instructions on every heater.

BETHLEHEM STEEL COMPANY, *General Offices*: Bethlehem, Pa. *District Offices*: Albany, Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Hartford, Honolulu, Houston, Indianapolis, Kansas City, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Portland, Ore., Salt Lake City, San Antonio, San Francisco, St. Louis, St. Paul, Seattle, Syracuse, Washington, Wilkes-Barre, York. *Export Distributor*: Bethlehem Steel Export Corporation, New York.

BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL



Off comes Dead Weight

. . . as the Railroads strip for action

EXCESS weight has no place in today's railroading. Strength—speed—power—all are visualized in terms of concentrated energy—in light, strong construction stripped for action, freed from the drag of dead weight. Every pound must justify itself, or off it comes.

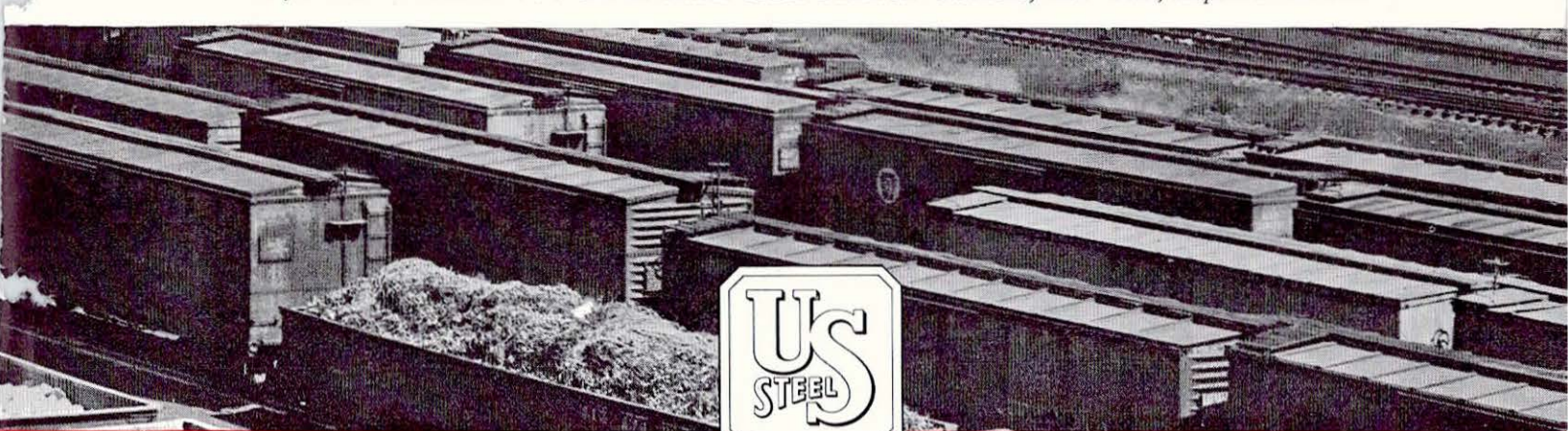
Look at the stainless steel Burlington "Zephyr"... the "Flying Yankee" of the Maine Central, Boston & Maine... the Illinois Central's "Green Diamond"... the Alton's "Abraham Lincoln"... the "Rebel" trains of the Gulf, Mobile & Northern—in all of them, excessive dead weight has been eliminated by the wide use of USS Stainless, USS COR-TEN and other USS High Tensile Steels. What these trains are doing to lower operating costs, to increase traffic, and to create earnings, is making railroad history.

But the surface has only been scratched. The saving that can be effected by these superior steels in reducing dead weight in freight cars is enormous. From freight comes six times as much revenue as from passengers. For every ton of dead weight which is replaced by a ton of freight, the railroad saves an average of approximately $18 per car per year.

Today, freight cars built with USS COR-TEN may be 20% lighter and more—equally strong, tough, and as lasting as the old heavy construction. If the tons of dead weight that COR-TEN eliminates were stripped from every freight car in the country, millions of dollars would be added to railroad earnings every year. And it can be done.

If you would like the full story of the economies that USS COR-TEN, USS Stainless and other USS High Tensile make possible, write to Railway Research Bureau, United States Steel Corporation Subsidiaries, Pittsburgh.

AMERICAN STEEL & WIRE COMPANY, *Chicago* and *New York* . . . CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh* and *Chicago* . . . COLUMBIA STEEL COMPANY, *San Francisco* . . . NATIONAL TUBE COMPANY, *Pittsburgh* . . . TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham* . . . COLUMBIA STEEL COMPANY, San Francisco, *Pacific Coast Distributors* . . . UNITED STATES STEEL PRODUCTS COMPANY, New York, *Export Distributors*



UNITED STATES STEEL

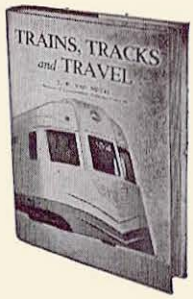
Valuable Books for Your Library

New Fourth Edition

Trains, Tracks and Travel

By T. W. VAN METRE

Professor of Transportation, Columbia University



The new edition of this popular book on railroads describes latest practice. There is a complete new chapter on streamlined trains and additions to others covering the new developments in air brakes, air conditioning of passenger cars and in high-speed Diesel and electric locomotives. Among the numerous new illustrations are shown the new streamlined trains. This is an excellent book for a boy who wants to know more about railroads and for the average reader.

Contents

Our Steam Railroads—The Railroad Track—The Steam Locomotive—Electric Locomotives; Gasoline and Oil Motors—Freight Cars—Passenger Train Cars—Tomorrow's Trains Become Today's—Passenger Stations and Terminals—The Operation of Trains.

1936. 4th. 312 pages, 276 illus., 7 x 9½ in., cloth, $3.00

Analysis of Railroad Operations

By J. L. WHITE

Formerly Assistant Comptroller, United States Railroad Administration; Director, Section of Transportation Service—Federal Co-ordinator of Transportation

Without going into the details of accounting procedure, Mr. White clearly explains the accepted method of analyzing and interpreting railroad statistical data. He describes how the figures produced in accounting departments should be used in the study of railroad operating results; how these figures reflect the various activities of the railroad and its efficient or inefficient operation as a whole or in any of its departments.

Classifications of the Interstate Commerce Commission are shown in full and frequent references are made to them in the main text.

1925. 391 pages, forms, index, work sheet, and the Jan. 1, 1935, order of the I. C. C., 6 x 9 inches, cloth. $4.00

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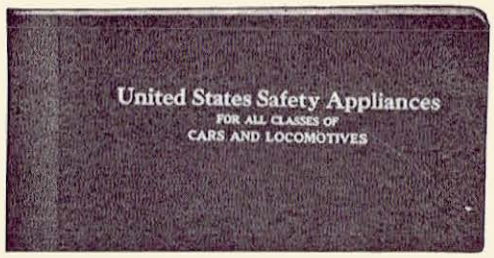


United States Safety Appliances

(A. A. R. Edition)

The 14th edition of this book contains all the new laws, I. C. C. rulings and A. A. R. specifications since the last edition in 1928. More than 250,000 of these books have been sold.

1935. 121 pages, 49 drawings, 7½ x 3¾, imitation leather, $1.00

When Railroads Were New

By CHARLES FREDERICK CARTER

A fascinating human interest story of the early American and Canadian railroads and of the men who built and ran them. The author, an old railroad man, tells of the beginnings of the Erie, the Pennsylvania, the Baltimore and Ohio, the New York Central, the first Pacific railroad, the Santa Fe, the Rio Grande, the Canadian Pacific and other lines. It is illustrated with reproduction of wood cuts of early locomotives and railroad scenes.

1926. 4th (Centenary). 338 pages, 17 illustrations, 6 x 9 inches, cloth. $2.50

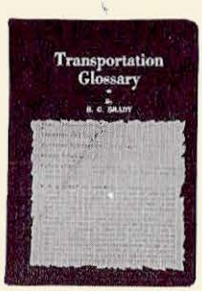
Who's Who in Railroading

The 9th Edition of what was formerly the "Biographical Directory of Railway Officials of America" is based upon a complete resurvey of the field by means of original questionnaires. Biographical sketches of some 4,000 railroad officials, equipment manufacturers, economists, members of regulatory commissions and others whose work is directly connected with the railroad industry of North America are presented. The descriptions of these leaders of the rail industry include personal information, such as their family connections and social, religious and political affiliations, as well as a complete outline of their professional careers.

1930. 579 pages, 6 x 9 x 1⅝ inches, cloth. $3.00

Transportation Glossary

By H. G. BRADY



Technical and semi-technical terms, phrases and expressions in more common use in railway, highway, air and marine transportation, and in port traffic are concisely defined in this handy reference book. Ordinary dictionaries, thesauri and law book sources furnish little information on transportation terms and this book fills a long felt need. It is printed in large clear type and cross references facilitate quick tracing of desired information.

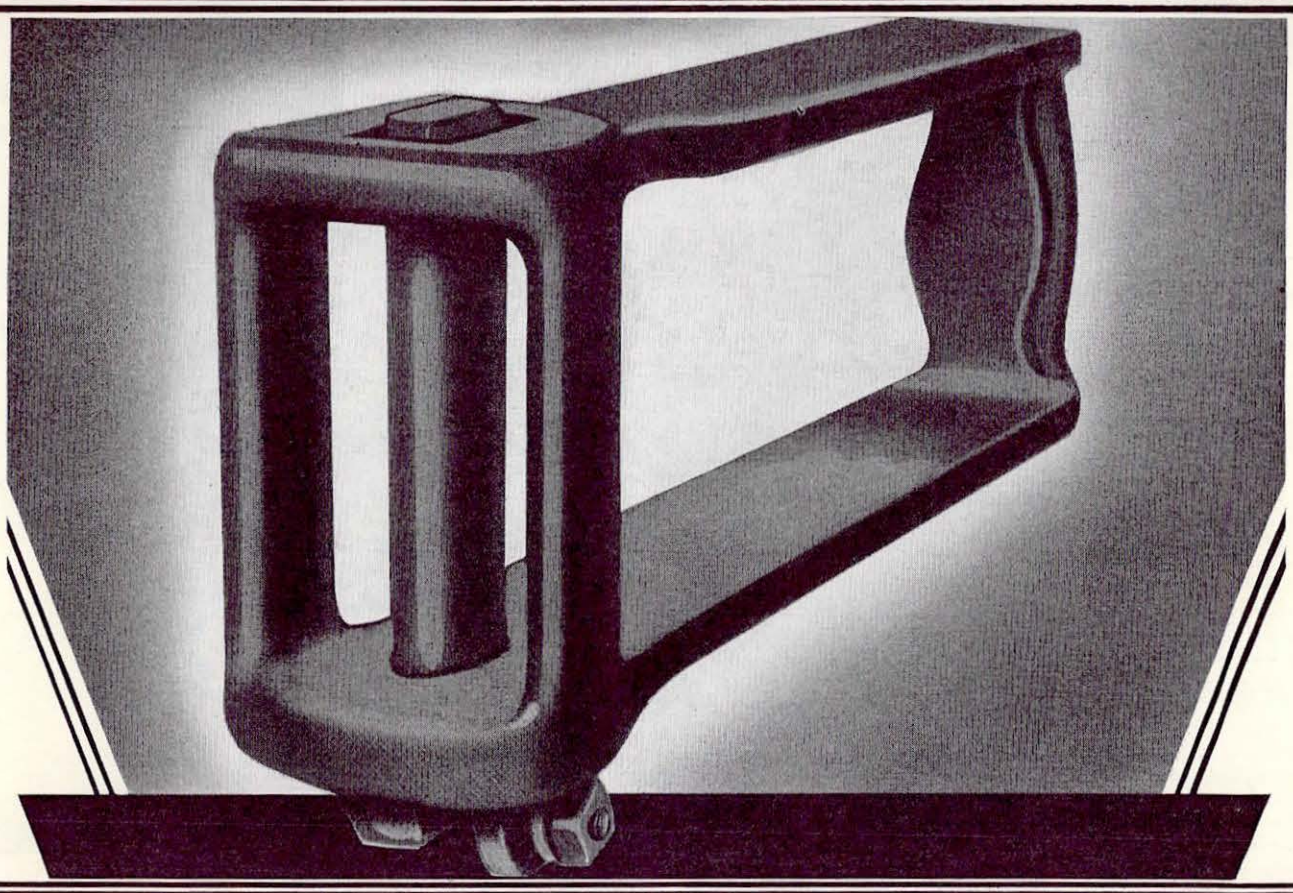
1929. 119 pages, 5 x 7 inches, flexible. $1.75

JANNEY VERTICAL KEY YOKE

A yoke made of cast steel for replacing obsolete wrought riveted yokes.

Train delays caused by broken wrought yokes with the resulting expense, are eliminated by the use of the Janney Yoke.

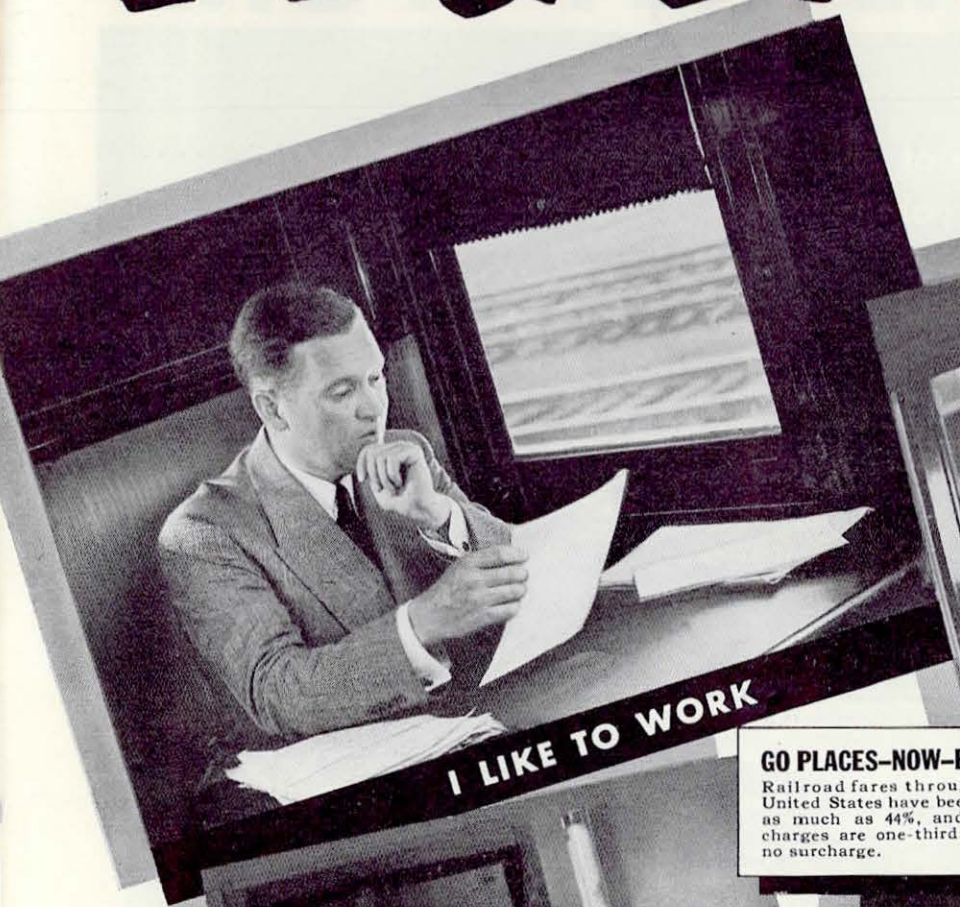
The replacement of loose rivets in wrought yokes, a continual source of expense, is avoided when Janney Yokes are used.



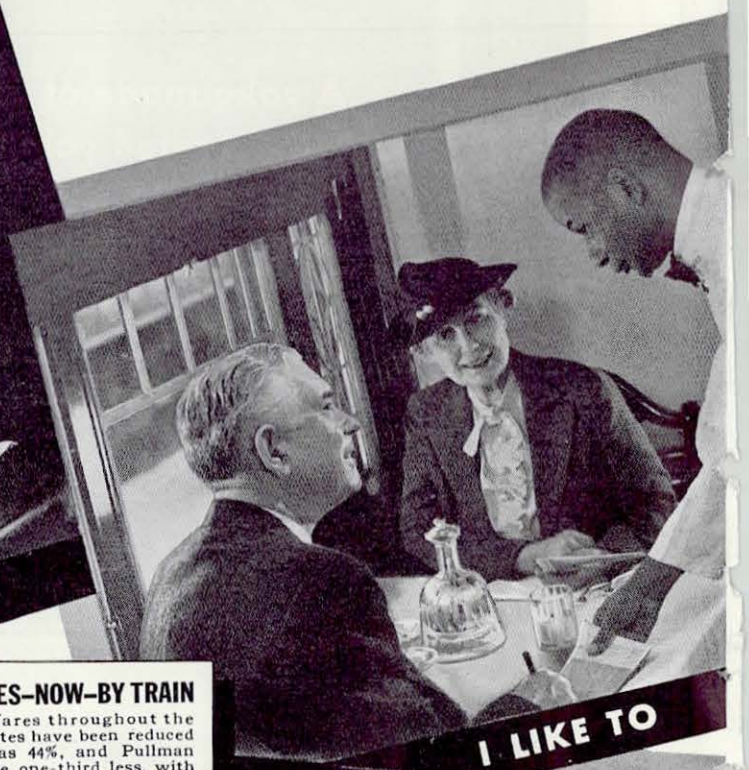
AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

TRAVEL—



I LIKE TO WORK

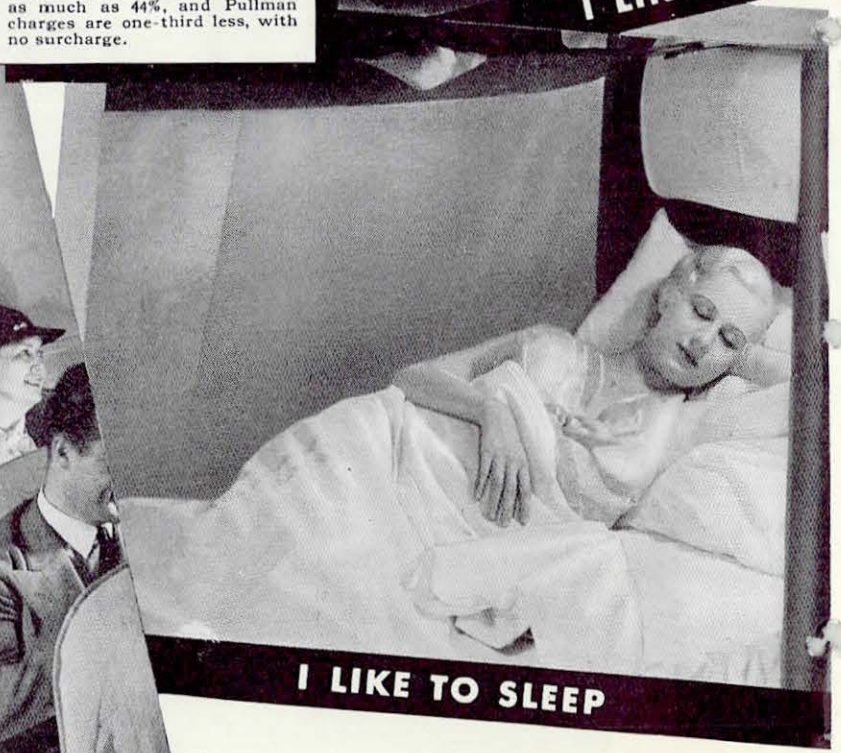


I LIKE TO

GO PLACES—NOW—BY TRAIN

Railroad fares throughout the United States have been reduced as much as 44%, and Pullman charges are one-third less, with no surcharge.

I LIKE TO MOVE AROUND



I LIKE TO SLEEP

DO YOU KNOW

—that the railroads haul a ton of freight a mile for an average revenue of less than a cent?

—that the speed of freight trains has been stepped up 43% in recent years?

—that by increasing the efficiency of combustion the railroads have cut fuel costs a half billion dollars in the past ten years?

—that 45 cents of every dollar the railroads take in go for railroad payrolls?

—that the railroads maintain their own "highways"—a quarter of a million miles of "line"?

—that many railroads will carry your automobile to vacation spots for the price of a third ticket?

—that you are far safer on a railroad train than you are in your own home?

SAFETY FIRST—
friendliness too!

ASSOCIATION OF

as you like it

THERE IS—in the speed, comfort, safety and dependability of the modern American railroad train—something for *each* traveler especially to enjoy.

You can do the thing you *like* to do, while you ride, almost with the same freedom and peace of mind that you would have in your own home.

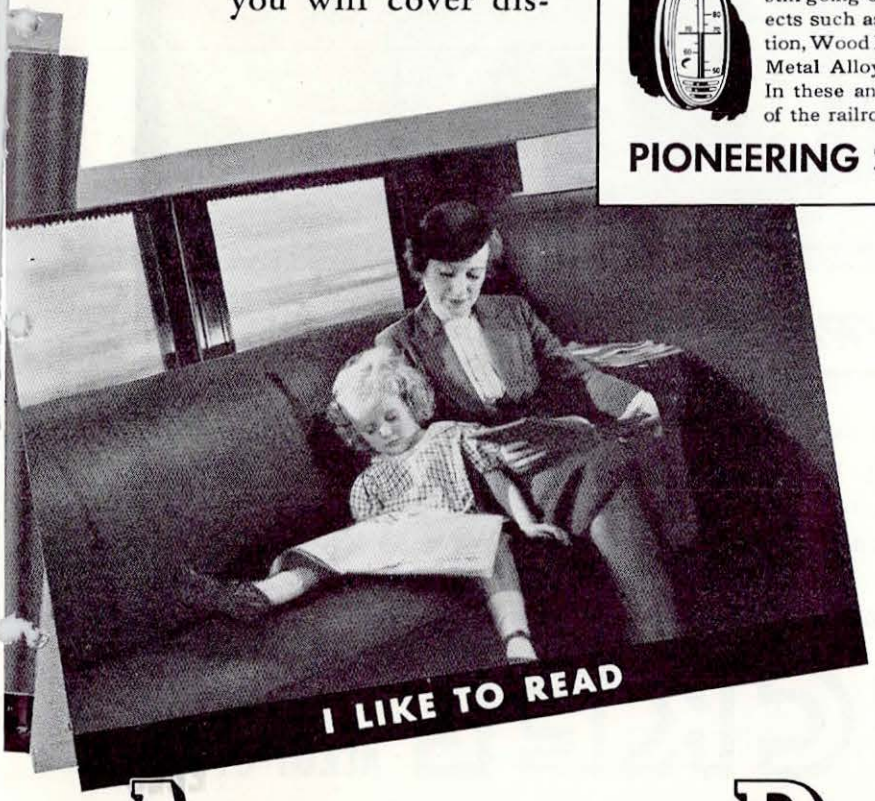
You know when you start out that you will get there on schedule. You know you will cover distances with the minimum of exertion, the maximum of ease. You know that whatever the weather or the route or the season, security and friendly service will attend you.

These benefits of railroad travel have become so familiar they are taken for granted. What may not be so familiar, unless you have traveled by train lately, is the extent of the improvements made and the new features added in recent years.

WEATHER AS YOU LIKE IT

Railroad research tackled the problem of air-conditioning more than twenty years ago, when a few dining cars were supplied with washed air. By 1930, cooled dining cars were introduced. Today more than *4,000* Pullman cars and *3,000* other cars provide the supreme comfort of air-conditioning—cool, clean, quiet, regardless of the weather outside. Research in air-conditioning is still going on, as it is in other varied projects such as Equipment Design, Combustion, Wood Preservation, Water Softening, Metal Alloys, Signals, Brakes and Rails. In these and in countless other activities of the railroads—

PIONEERING STILL GOES ON!



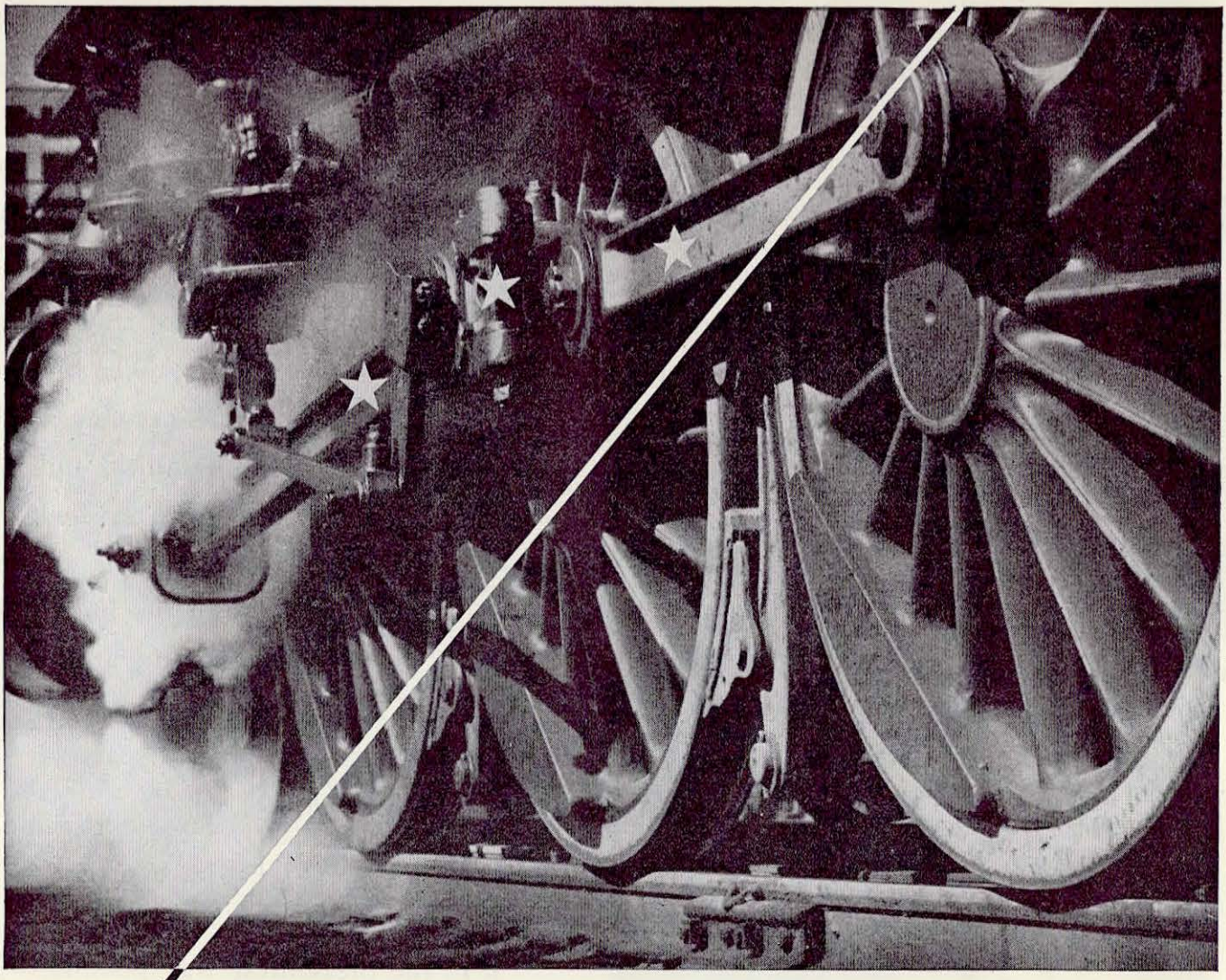
So next time you have a trip to make—and want to make it in the pleasantest way possible—go by train and see for yourself.

See how faster schedules, modern equipment, air-conditioning, and *billions* put into heavier rails, safety signals and roadway maintenance, are keeping the American railroads out in front as the most reliable and progressive transportation system in the world!

AMERICAN RAILROADS

Transportation Building, Washington, D. C.

TOUGHNESS ★



WHERE OVERSTRESS OCCURS

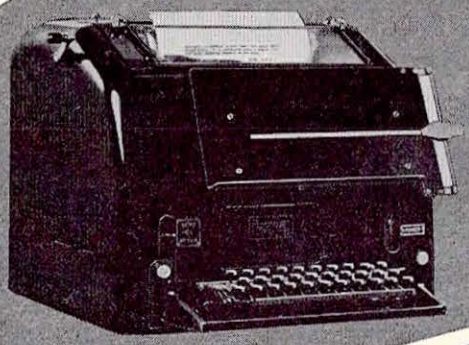
The complex stresses to which piston rods, side rods, main rods, crank pins and driving axles are subjected, frequently result in overstressing and failure.

But when the Nickel Steels are used the danger of failures is greatly minimized by the superior toughness of these steels. The Nickel content provides higher ductility and resistance to impact, along with higher elastic properties.

Not only in steels, but in the cast irons as well, additions of Nickel impart superior mechanical properties, providing materials that give long and low-cost service in a host of railroad applications. We invite consultation on the use of Nickel Alloy Steels, Nickel Cast Irons and other alloys containing Nickel in your equipment.

NICKEL CAST IRONS • ALLOY STEELS

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N.Y.



Teletype typewrites by wire — a few feet or thousands of miles.

TELETYPE

has "streamlined" communications for the Burlington since 1911

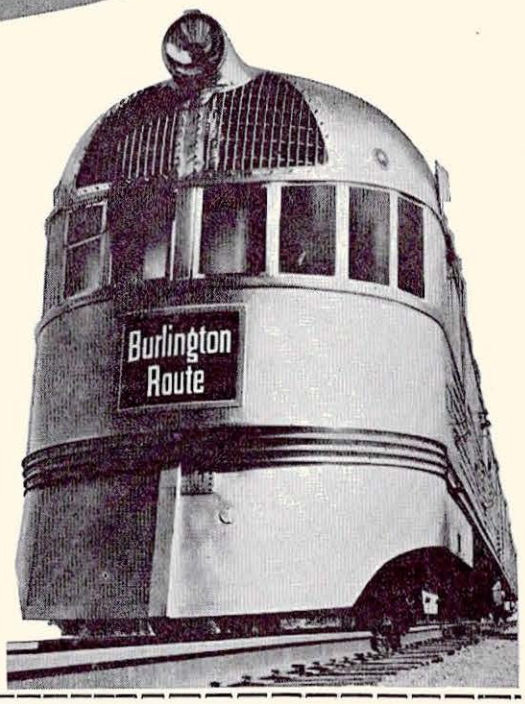
THE Burlington has been first to adopt many modern, high-speed methods of serving the public. For example: railway mail cars, telephone train dispatching; light, fast streamlined Zephyr trains.

So it is not strange that this progressive road was also the first to use Teletype to speed up its communications.

Back in March 1911, the Burlington installed a duplex circuit between Chicago and Galesburg. This was the first major installation of Teletype, then known as the Morkrum printing telegraph.

Today the Burlington—like other leading roads—employs Teletype on its fast main line telegraph circuits, speeding messages, movements and reports of all kinds.

Let Teletype "streamline" your communications, too.



TELETYPE
REG. U. S. PAT. OFF.
SUBSIDIARY OF
Western Electric Company

TELETYPE CORPORATION, 1400 Wrightwood Avenue, Chicago, Illinois

Gentlemen: Please send me information on how Teletype can help to solve our communication problems.

RA-10-3-36

Name.....

Railroad.....

City..... *State*.....

DEPENDABILITY, long life and low maintenance cost are important advantages of AmCreCo products for which remarkable records have been established on scores of railways. With pressing demands on every dollar of construction money, experienced railway engineers specify these creosoted ties, piles, poles and timber where economy and ease of maintenance are of prime consideration.

AMERICAN CREOSOTING COMPANY

INCORPORATED

COLONIAL CREOSOTING COMPANY INCORPORATED

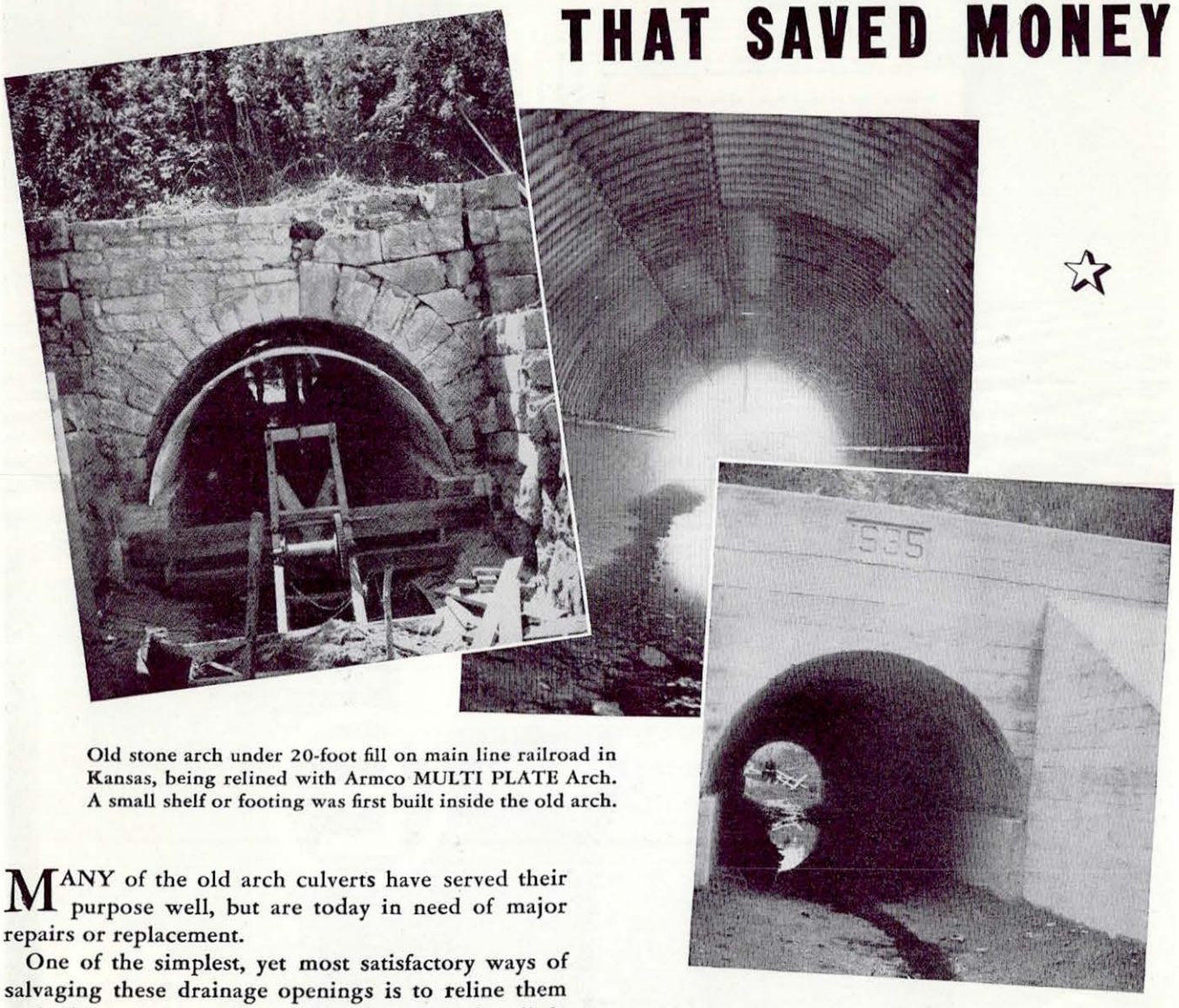
AMCRECO LOWRY PROCESS CREOSOTED WOOD

GEORGIA CREOSOTING COMPANY INCORPORATED

ADDRESS INQUIRIES TO CHICAGO, ILL., OR LOUISVILLE, KY.

Another Relining Job

THAT SAVED MONEY



Old stone arch under 20-foot fill on main line railroad in Kansas, being relined with Armco MULTI PLATE Arch. A small shelf or footing was first built inside the old arch.

MANY of the old arch culverts have served their purpose well, but are today in need of major repairs or replacement.

One of the simplest, yet most satisfactory ways of salvaging these drainage openings is to reline them with Armco Multi Plate. There need be but little reduction in waterway area.

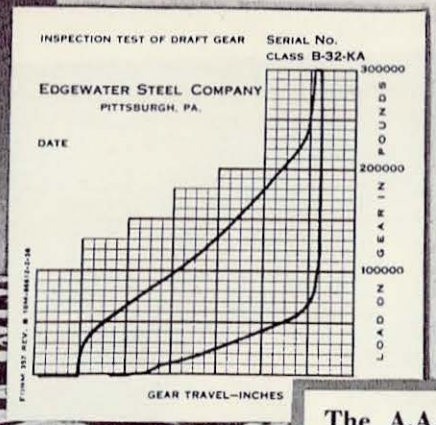
These thick corrugated plates are quickly bolted together to form a strong, durable structure, either as an arch or a pipe.

Let an Armco drainage engineer discuss the application of Multi Plate to your particular problems. Just call or address the nearest office listed at right.

INGOT IRON RAILWAY PRODUCTS CO.
(Member of the Armco Culvert Mfrs. Assn.)
Middletown, Ohio • Berkeley, Calif.
Philadelphia • St. Louis • Salt Lake City • Los Angeles
Minneapolis • Houston • Portland • Atlanta • Denver
Chicago • Dallas • El Paso • Spokane • Cleveland
Pueblo • Sidney • Richmond

ARMCO MULTI PLATE MULTI ARMCO PLATE **For Economical Drainage**

WHAT ARE YOU GETTING FOR YOUR MONEY?



Force-Closure Diagrams

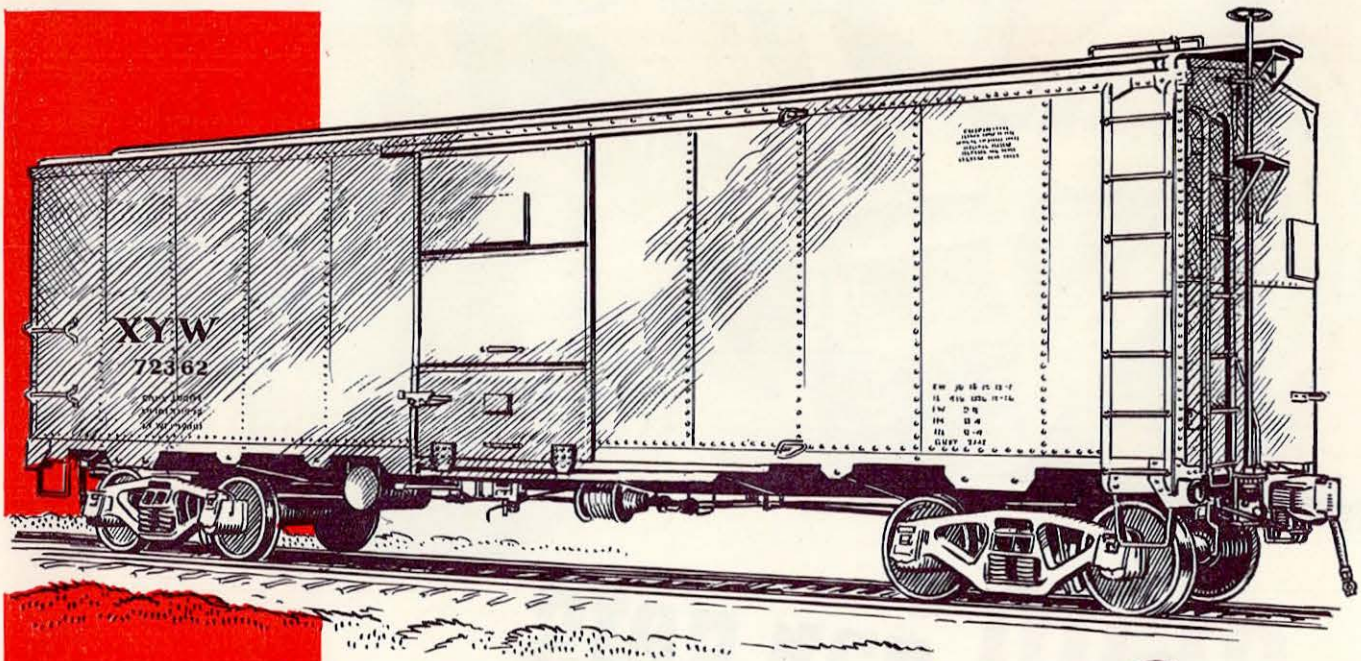
The A.A.R. Specifications show the capacity you may expect.

The Force-Closure Diagram taken automatically from each Edgewater B-32KA* Gear shows exactly the capacity you get.

* Certified by Association of American Railroads

EDGEWATER STEEL CO.
PITTSBURGH PENNA.

Sales Offices: Atlanta, Baltimore, Boston, Chicago, Kansas City, Louisville, New York, Philadelphia, Portland, St. Louis, San Francisco, St. Paul, Seattle, Washington



New Freight Cars spend less time on rip track — More time in service

SOME of the convincing conclusions reached by Coverdale & Colpitts, consulting engineers, in their report on the "Economic Aspects of the Freight Car Situation" regarding the maintenance costs and age of equipment are as follows:

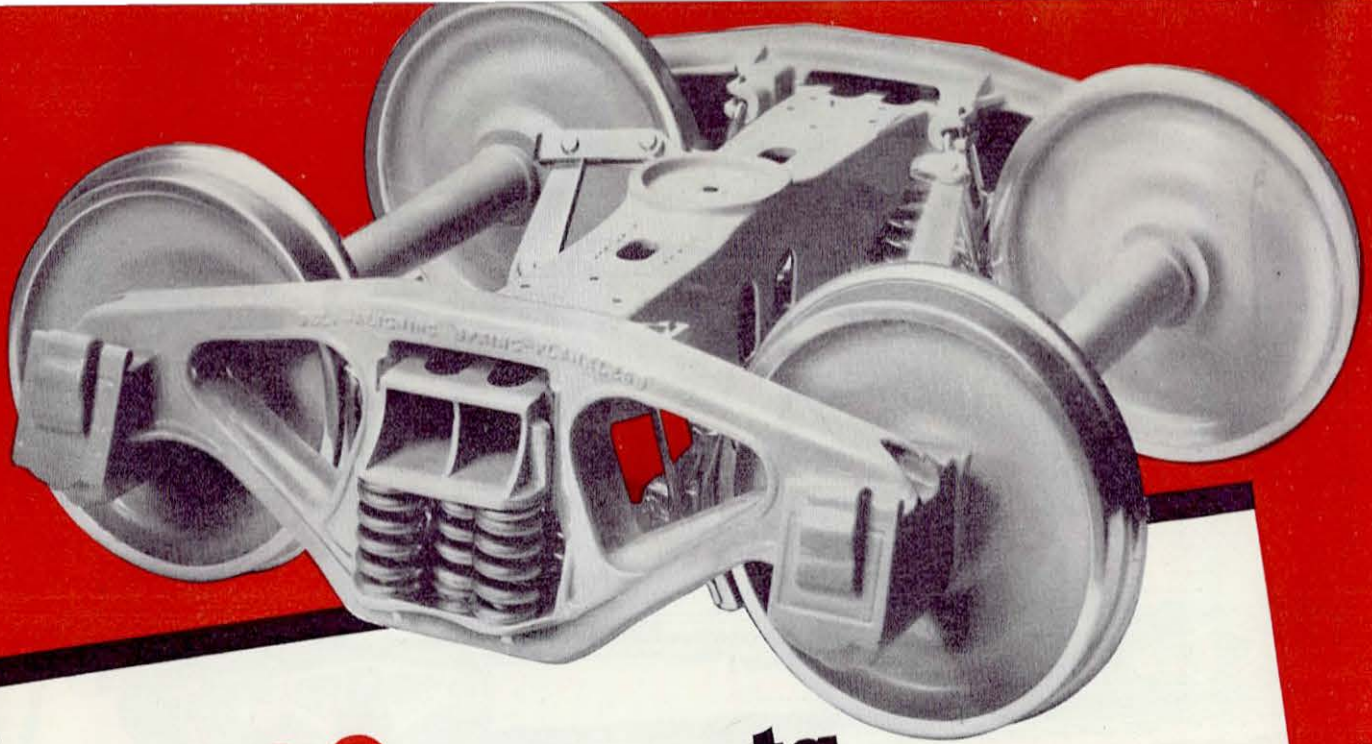
"Older cars must be switched to the repair track more frequently and the number and amount of minor repairs increase fairly rapidly when the car is close to the end of its service life.

"On the basis of our analysis of the actual results with regard to maintenance and rebuilding costs and restored life of many thousands of freight cars repaired and rebuilt, there can be no other conclusion than that the rebuilding programs were uneconomical and brought about a greater expense than would have been the case had the cars been retired and replaced with new cars. Only on premises which fail to stand analysis can the rebuilding program be shown in a favorable light so far as these particular experiences are concerned."

Modern cars have been constructed so that they will spend even less time on the rip track than has been the practice in the past. All the improvements of design by the Car Construction Committee to meet exacting operating requirements most economically can only be obtained from a new car.

American Railway Car Institute

19 Rector Street New York, N. Y.

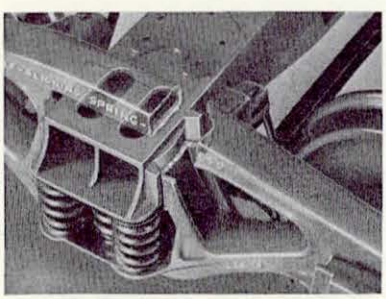


9500 car sets ordered in 8 months

Over 9500 car sets of Self-Aligning Trucks have been ordered to date in 1936 . . . positive recognition of their sound design, dependability and economy.

Self-Aligning (spring-plankless) Trucks are not in the experimental stage. Side frames, bolsters, spring seats and brake arrangements are based on designs that have proved their stamina . . . that are known for their low maintenance and low operating costs.

The increasing number of orders that specify "Self-Aligning" are also recognition of the fact that Self-Aligning Trucks are made by specialists in cast steel construction . . . manufacturers who have developed the most efficient design and the best practices for the production of sound casting.



Cylindrical column construction permits necessary flexibility. Wide bearing areas are always in contact . . . insuring long wear . . . and lowering maintenance costs.

Specify "Self-Aligning"

SCULLIN STEEL CO.
ST. LOUIS, MISSOURI
NEW YORK • CHICAGO • ST. PAUL • CLEVELAND • PHILADELPHIA • BALTIMORE
Licensed Manufacturer of Self-Aligning Trucks

SELF-ALIGNING TRUCKS

spring-plankless double-truss

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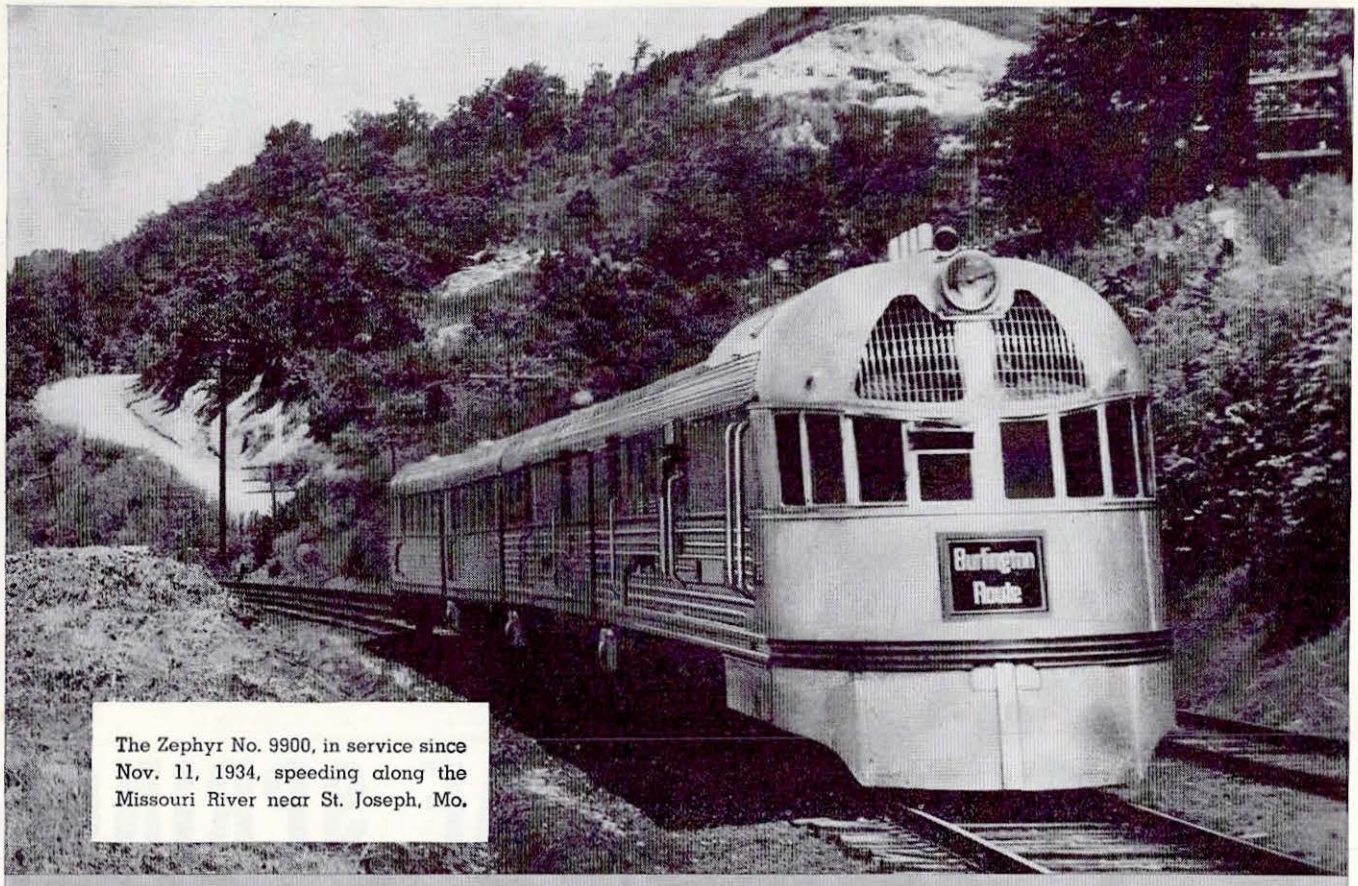

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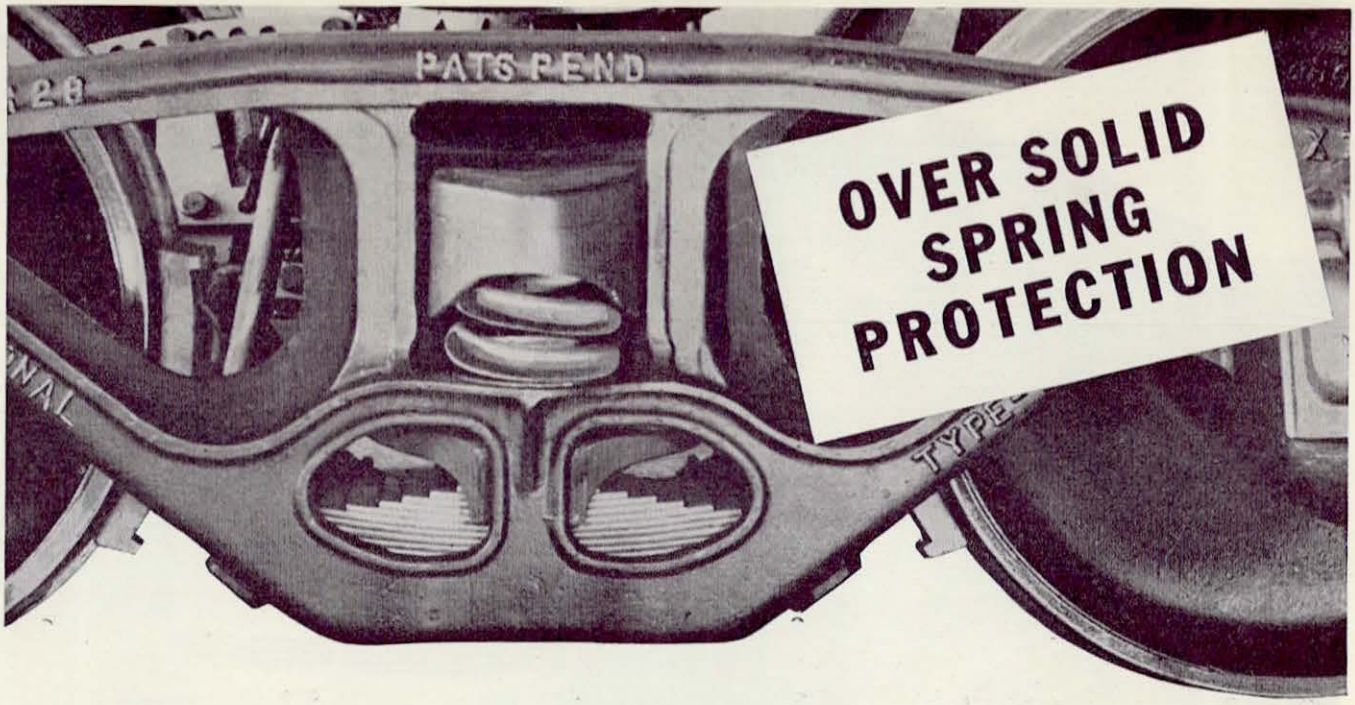

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WHAT BREAKS STAYBOLTS?

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RAILWAY AGE

Agriculture, Industry and Transportation

"For fifteen years," said Governor Landon in his address at Des Moines last week, "we have been struggling with what has been called 'the farm question.' It is not a farm question, but a national question." No truer or more important statement has been or will be made during this political campaign. It is unfortunate for the railroads, the industry, and the commerce of the United States and for their employees that the "farm question" was not clearly recognized by them as a "national question" in time to prevent it from becoming one of the most serious problems with which the nation ever was confronted. The failure to so recognize it, and to deal with it accordingly, is a striking illustration of the lack of political and economic statesmanship which prevailed under the Old Deal and helped to cause the depression.

While the "farm question" is fundamentally economic, it has become of great political importance. Labor union leaders and other radicals who are trying to effect a permanent farmer-labor political combination to get control of government show that they see this much more clearly than most business men do. The gainfully employed part of the population is roughly divisible into three classes. Forty per cent are manual employees of transportation, communication, manufacturing, construction, and mining. Forty per cent are farmers, farm workers and residents of rural towns of less than 2,500 inhabitants. The remaining twenty per cent are large and small business men, professional men and their employees, other "white collar" workers and domestic servants. The farmers hold the balance of power and will determine how far the "class struggle" develops in this country and its result.

Farmers Naturally Conservative

The farmer in this and every other country is naturally a conservative. He owns, or wants to own, his farm. Being or desiring to be a capitalist, he desires property to be protected from confiscation and socialization whether by excessive taxation or otherwise. But he also desires to derive a return from his investment and a compensation for his work which will give him an income comparable with the incomes derived by other persons from equal investment and work. If he fails or thinks he is failing to do so he is prone to blame the economic system and those he believes are running it, and to resort to political methods in an attempt to equalize the balance in his favor.

Farmers in the aggregate have great political power when disposed and organized to use it. Radicals are trying to get them to support policies which tend to sap and finally would destroy the capitalistic system. The business leadership of the country must help to array the farmers on the side of capitalism, in which they have a greater stake than any other equally numerous class, if capitalism is to be able to withstand the political attacks being made upon it. The farmers can be arrayed with business against radicalism only by making capitalism work fairly and advantageously to the farmers.

Loss of Farmers' Export Market

For some years before the depression it was becoming constantly plainer that our economic system was functioning adversely to agriculture. Numerous measures were advocated and some adopted to remedy the situation, or at least to placate the farmers. But neither during the late 'Twenties nor during the first three years of the depression was anything really constructive done by government, finance or business to effect changes which would assure the farmer the income to which he was entitled and which it was necessary for him to have in order to make him as good a customer for transportation and industry as it was necessary for them that he should be.

The farmer's income depends upon the volume of his products and the prices that he gets for them. Before, during and some years following the Great War, he exported a large part of his products, and export prices largely determined his domestic prices. The total exports of this country in 1925 were $4,910,-

000,000, of which $2,136,000,000, or 43½ per cent, consisted of products of agriculture. In the four years ending with 1928 total exports averaged $4,929,000,000 annually of which an average of $1,925,000,000, or 40 per cent, were farm products. In 1929 total exports were $5,221,000,000 of which only $1,693,000,000, or 32 per cent, were farm products. During these years the prices of farm products were relatively about as high in comparison with those of other commodities as before the war, but the figures show that during these years the American farmer was steadily losing his export market. In 1930 total exports declined to $3,840,000,000 and exports of farm products to $1,201,000,000; and there was a much sharper decline in the prices of farm products than in those of other commodities.

Effect on Farm Prices

What caused the decline of exports? For some years previously exports from this country had been largely maintained by the purchase of foreign securities by American capital. We were in this way loaning foreigners a large part of the money with which they were buying our exports. The drastic decline of American lending abroad which occurred in the late '20's made it necessary, if we were to maintain our exports, largely to increase the amount of imports we would accept in payment for our exports. On the contrary, Congress in 1930 increased protective tariffs, which inevitably reduced imports and thereby reduced exports. In the three years 1930-1932, inclusive, total annual exports from this country averaged only $2,126,000,000 and exports of farm products only $895,000,000. This made exports of farm products 54 per cent less than they averaged in the four years 1925-1928, inclusive.

Other industries drastically reduced their production during these years while agriculture did not. In consequence, there was a great increase of the farm surpluses that had been accumulating, and in 1932 the average wholesale price of farm products was 52 per cent less than in 1926, while the average wholesale price of other commodities was only 31 per cent less. The economic system of the country had been completely unbalanced by policies which maintained production and greatly reduced prices in agriculture, which reduced production and, by comparison, largely maintained prices in industry and which thereby in great measure destroyed the ability of the 40 per cent of the country's population on farms and in rural communities to buy the products of industry.

New Deal and the Farmer

Then came the New Deal which advanced hourly wages, and consequently industrial costs of production and prices, by means of NRA. The inevitable tendency of this was to reduce agriculture's ability to buy transportation and the products of industry. In addition, however, there was adopted AAA for the purpose of curtailing agricultural production and increasing farm prices. AAA, aided by drouths, largely accomplished its purpose. Between February, 1933, and June, 1936, the average wholesale price of all commodities advanced almost 33 per cent, while the average price of farm products increased 90 per cent, with the result of restoring farm prices almost to the same relationship to other prices that existed in 1926.

This readjustment of prices is unquestionably one of the important reasons for the improvement in general business that has occurred. But it has been secured at a very great cost both in subsidies that have been distributed among the farmers and especially in the creation of a price system the continuance of which probably would make it indefinitely impossible to recover foreign markets for American farm products. It has imposed upon the nation an economics of scarcity which tends to restrict all production, both agricultural and industrial, although the plain fact is that only by the maximum production of which the capital, brains and man-power of the country are capable can there be provided full employment and a large and increasing income for every class.

Governor Landon's Program

Governor Landon said in his address at Des Moines:

> The American farmer wants to produce without fear. * * * There is nothing more satisfying than raising good crops, having a crib full of corn, plenty of hay in the mow or stack and hogs and cattle fattening in the feedlot. * * * All the farmer asks is that his income be on a parity with the rest of the nation, that he may enjoy the same standard of life, that his home be made secure, and that he be able to build up a reserve for the future. It is to the direct interest of the consumers and other producers of this nation that the farmer be a good provider and a good customer. * * *
>
> For many years farmers producing crops of which there is normally an exportable surplus have worked under a handicap. * * * The surplus is sold on world markets and the price of the entire crop is affected by what the surplus will bring. Tariff protection for these products, generally speaking, is ineffective except when there is a shortage. * * * World markets are largely closed to our agriculture surpluses. * * *
>
> The Republican party proposes to offset these disadvantages by the payment of cash benefits. * * * We are pledged by our platform "to provide, in the case of agricultural products of which there are exportable surpluses, the payment of reasonable benefits upon the domestically consumed portion of such crops, in order to make the tariff effective." This means that our farmers will receive an American and not a foreign price for their products.

Essentials of Farm Policy

What this means, as we understand it, is a system under which the American farmer would produce without restriction; would sell his exportable surplus products in the markets of the world at the prices prevailing in those markets; and would be provided in some way with a subsidy on the domestically consumed part of his products that would maintain what he received for his total products on a parity with other domestic prices. This paper does not consider itself competent to express an opinion as to whether such a policy could or probably would be so carried out as to accomplish

its purpose. But it has no hesitation in maintaining that it is essential to the political and economic welfare of the United States that two things shall be accomplished. One of these is the maximum production that American agriculture can achieve without impoverishing the soil. The other is the establishment and maintenance of a reasonable and fair parity between farm prices, on the one hand, and freight rates and industrial prices, on the other hand. This is politically essential because otherwise most farmers will go radical. It is economically essential because farmers afford the largest single market for the service of transportation and the products of industry, and without making and keeping the farmers prosperous the railroads, industry and their employees cannot prosper.

Subsidies for Farmers?

We have protective tariffs that have been established and maintained upon the assumption that they enable industry and its employees to enjoy larger incomes than they otherwise would. It is absolutely unsound, politically and economically, to employ artificial measures, whether tariffs or monopoly practices by business and labor unions, to maintain high prices and wages in industry and not adopt whatever compensating measures may be necessary to maintain farm prices and incomes on a relatively equal level. The farmer cannot make his full share of contribution to the country's prosperity without producing to his capacity; and if he produces to his capacity he must be provided with a foreign market for his surplus products and a domestic market at American prices for the great bulk of his products. If this can be accomplished only by a two-price system under which he will in some way be given subsidies on the domestically-consumed bulk of his products, then the two-price system for agricultural products should be adopted.

This paper frankly does not believe that the general policy of maintaining wages, costs of production and prices in this country on an artificially high level by means of protective tariffs and monopoly practices by labor and industry is sound economic policy for the long pull. It does not believe in subsidies. But whatever the general policy adopted for industry and labor may be, a corresponding general and compensating policy for agriculture must be adopted in the interest of both the political and the economic welfare of the country.

Excursions a Means of Winning Public Favor

The railways, particularly in the East, have been encouraging a rapidly growing "fan" interest in railroading by operating, from time to time, popular-priced excursions featuring some railroad yard or shop as their principal objective. A few weeks ago the Pennsylvania had over 500 passengers on such an excursion from Philadelphia which, among other places, visited Enola yard. On September 20 the New York Central and Delaware & Hudson were hosts, on two excursion trains, to a group of 700 "fans," who were taken from Weehawken, N. J., to Kingston, N. Y., on the West Shore Railroad, thence over the Catskill Mountain branch (the former Ulster & Delaware) to Oneonta, where the D. & H. exhibited its shops and representative equipment. Returning, the trains proceeded to Albany over the D. & H. and thence back to New York, over the New York Central.

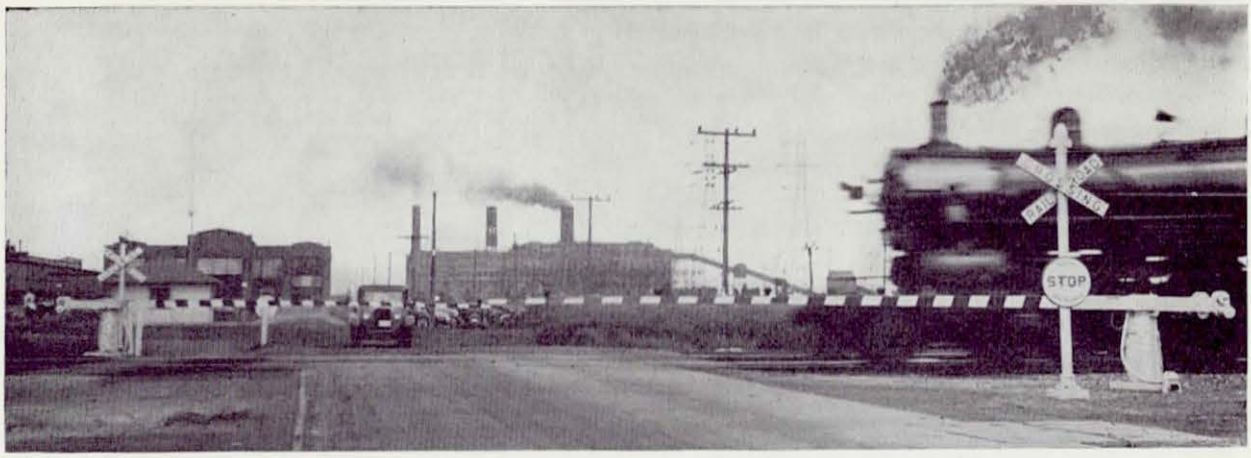
Typical of the real imagination which went into the planning of this trip was the display of several New York Central and New York, Ontario & Western locomotives, under steam, at Weehawken before the excursion started. Passengers were freely admitted to the cabs of these locomotives and were allowed to ring the bells and blow the whistles to their hearts' content. Literature was distributed on the train which gave the passengers all the information they needed to enable them to "railroad" as they went along.

It has been truly said that a whole generation has grown up which knows nothing about railroad service and traditions. The railroads' problem is very largely one of public relations and an indifferent public is a hard public to "sell." So the railroads, recognizing the problem and one means of overcoming it, are beginning to act with vigor and imagination in the creation and stimulation of a genuine "fan" interest in the details of railroad equipment, construction and operation. The "wonder trips" and "off the beaten track" excursions are growing in popularity. As to their effectiveness in making friends for the railroads, our only suggestion is that any one with any doubts on this score take one of the trips for himself. And what works in the East, which is probably the least "railroad-minded" section of the country, ought to be quite as, or even more, effective elsewhere.

Reduced Fares, Modern Trains May Bring Economic Changes as Great as Cheap Motoring

It is too early to form a comprehensive judgment on the effects of fare reduction, but enough has been seen to warrant the statement that if they are continued in combination with light-weight, ultra-modern train service, changes in our economic life almost as revolutionary as those brought in by the automobile may eventuate. The point is not that there will be a reversion from individual transportation to train and bus passenger traffic, a revival of the living and traveling methods of the turn of the century. Rather there exists the real possibility that, just as bus travel tapped entirely new markets, and continues to do so with its own reduced fares, a world of travel is opening up to those who never knew the meaning of the word a few years ago. In short, what those in charge of all forms of transportation are discovering is that America is a traveling nation; and that as a people Americans will travel whenever that commodity is offered in an attractive package at a price within reach.

From an Editorial in the Wall Street Journal



When the Gates Are Down, It Appears to the Driver of an Approaching Vehicle That Each Arm Extends Across the Entire Width of the Pavement

Chicago & North Western Installs Automatic Gates

Replaces part-time watchman service with improved 24-hr. protection

THE Chicago & North Western has installed automatically-controlled, electro-hydraulic gates at the Greenwood Avenue crossing in Waukegan, Ill., to provide full 24-hr. protection in place of 16-hr. watchman service formerly in effect at this crossing. At this location, an east and west highway crosses the Milwaukee division double-track main line, which is used by the "400" and other high-speed through passenger trains, aggregating 30 scheduled passenger trains, in addition to several freight trains daily.

This section of Greenwood avenue is the main highway entrance to an extensive asbestos plant of the Johns-Manville Company and a super-power station of the Public Service Company of Northern Illinois, and in addition to numerous trucks, the highway traffic includes the automobiles of employees going to and from work. The view of northbound trains from an eastbound vehicle is obstructed by a hotel building and an adjacent tavern; otherwise, the view is unobstructed.

This crossing was formerly protected by a watchman for two tricks covering the period from 6 a.m. to 10 p.m. When the Johns-Manville plant increased its schedule to 24-hr. continuous operation, this resulted in a much greater use of the crossing and especially when the shifts change at 7:30 a.m., 3:30 p.m. and 11:30 p.m., a continuous stream of traffic moves over the crossing for half an hour or more. In consideration of these circumstances, action was taken by the railroad to improve the existing protection and the installation of automatic gates was proposed. This proposal met with the approval of the city and factory officials and was also approved by the Illinois Commerce Commission.

Location of Gate Posts and Length of Arms

The concrete pavement of the highway approaching the crossing from the west is 20 ft. wide. Cinder filling, level with the pavement, extending from the pavement to the north line of the highway, provides a sidewalk for pedestrians. Owing to the heavy pedestrian traffic over the crossing, it was decided that the gates should be so located as to include the sidewalks as well as the roadway.

Where gates are controlled automatically, the Illinois Commerce Commission has approved the use of a gate that extends only over the right half of the pavement as viewed by a motorist approaching the crossing. The theory of this is that obstruction of the normal path of travel affords adequate protection, and if the gates should fail in the lowered position or are so held by a train stopped on the control circuits, the highway will not be blocked indefinitely because, after a driver has stopped and has ascertained the position of trains, he can, if necessary, turn to the left and pass around the end of the gate arms. The use of arms blocking only the right half of the roadway has another advantage in that vehicles on the track, when the gates are lowered, may leave the crossing without hindrance. This method, approved by the commission with respect to the location of the gate posts and the length of the arms, was adopted. As installed, the gate posts are 15 ft. from the edge of the pavement, while the arms are 27 ft. long so as to extend 2 ft. beyond the center line of the 20-ft. pavement. The gate posts are located approximately 18 ft. from the nearest rail of the track.

Stop Signs and Bell

In addition to the gates, a standard crossbuck "Railroad Crossing" sign, mounted on a pipe mast, is located at the right of the highway approaching from each direction, as well as a city ordinance circular STOP sign for each direction of approach. These crossbuck and stop signs were in service prior to the installation of the gates. A standard crossing bell, installed as a part of

the gate project, is located on the top of the sign post east of the tracks, which rings automatically from the time a train enters a control circuit until the gates are down.

Viewed from a distance, the two gate arms present the appearance of one gate or barrier extending entirely across the highway. In order that the night aspect should duplicate the day aspect, as just explained, a row of red lamps across the entire highway, visible to highway traffic in both directions, were attached to the top edge of the gate arms. In order to cover the entire width of the highway and outline the length of the arm, four lamps were provided on each arm. The lamp on the tip is located as near as practicable to the end so as to mark the extent of the arm when down. The other lamps are spaced five feet apart. To insure that the lamps should provide a long-distance warning to a motorist approaching at speed, a three-inch, optical-type lens was adopted, affording a long-range aspect, rather than using a wide-angle lens which would give a good short-range warning but would be unsatisfactory at longer distances.

The lamps are equipped with 10-volt, 10-watt bulbs, and are lighted continuously whenever a train is occupying an approach control circuit; they remain lighted until the gate arm is raised to its normal position. By this scheme the position of the arm is clearly defined at night. The normal control of the lights is effected through the regular approach circuits. The lamp feed is paralleled by a circuit controlled through a mercury contact on the gate mechanism, which remains closed except when the gate is raised to its normal position.

Type of Gate Mechanism

The gate mechanisms used in this installation are of the electro-hydraulic type furnished by the Western Railroad Supply Company. The mechanisms differ somewhat from those of the same manufacture described in previous articles in that, rather than using one centrally located motor-pump unit with separate oil lines to each gate mechanism, each gate unit at this crossing has a separate motor-driven oil pump as an integral part of its mechanism, thus eliminating underground oil pipe runs and presenting the further advantage that any defective operation is localized to one gate.

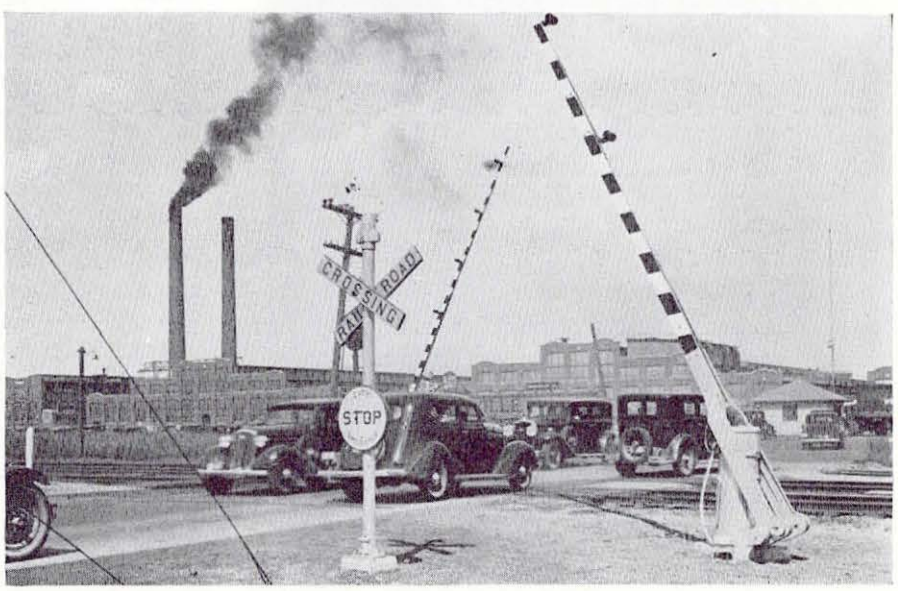
Each gate machine consists of a cast-iron base and housing 36 in. high, on top of which is mounted a pivoted head operating in the horizontal plane which includes the horizontal shaft for the gate arm. This head rests on a central roller bearing that is supported by a spider attached to and cast with the housing. The roller bearing permits the head, together with the gate arm, to be moved around horizontally through 120 deg. in the direction away from the track. This feature was provided so that if the gate is lowered when a vehicle is on the tracks, the arm will swing outward if the vehicle is driven into it. A special latch attached to the housing near the top carries a roller that engages a slot in the pivoted head, locking the gate to prevent side motion on to the track, yet designed to allow the arm to be swung away from the track if a lateral pressure of 25 lb. is applied midway of the arm. This feature prevents wind pressure from swinging the gate out of position when it is in either the up or down position.

Operation of Gates

Each gate arm is operated by a mechanism including a cylinder of 4-in. inside diameter and 12 in. long, the piston of which operates a connecting rod extending to a crank on the shaft to which the gate arm is attached. When the gate arm is in its raised position, all parts of the mechanism are at rest and de-energized. When a train enters an approach circuit, the motor is started and the solenoid valve is energized. A rotary pump driven by the motor draws oil from the reservoir and forces it through a one-way valve, then through a cross T directly to the bottom of the cylinder. When an oil pressure of approximately 80 lb. is reached in the supply line, the piston and vertical connecting rod transmit motion to a crank attached to the horizontal shaft to which the gate arm is secured, forcing the arm downward.

One degree before the extreme downward position is reached, the motor circuit is automatically opened by a mercury contact operated by the horizontal shaft crank. The arm is held in its downward position by the constant pressure against the piston, which is maintained by the closing of the solenoid valve. If the downward movement of the arm is arrested before the desired position is reached, the pressure in the supply line increases owing to the continuous action of the pump. At approximately 10 lb. above normal working pressure, a pressure valve, inserted in a by-pass line between the third opening of the cross T and the reservoir, reduces the excess pressure by allowing the oil to escape back to the reservoir.

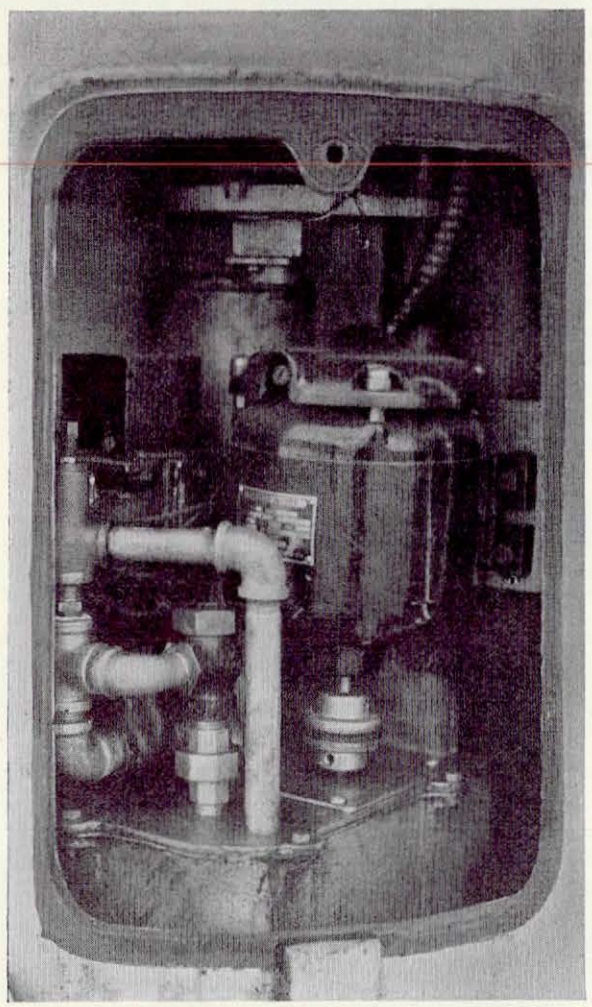
In addition to relieving the pressure and preventing



Heavy Automobile Traffic Is Handled on the Highway Where It Crosses the Double-Track Main Line

General View of Crossing Looking North, Showing the Gates, Automatic Block Signals and Instrument Housings

the possible stalling of the motor, this feature is especially desirable if the arm, in its descent, should come to rest on the top of an automobile, as very little resistance is needed to impede its downward progress. After a train has passed over the crossing, the restoration of the control circuits to normal immediately de-energizes the magnet of the solenoid valve, which is inserted in the return line between the remaining opening of the cross T and the reservoir, permitting a free flow of the oil back to the reservoir. The arm is so counterbalanced that as soon as the pressure is relieved, it is returned to its upward position by gravity in approximately five seconds. This quick raising of the arm expedites the movement of highway traffic over the crossing after it has been stopped by trains.



View of One Side of the Interior of Mast Showing Motor, Pump and Reservoir

Automatic Control

This double-track line is equipped with automatic block signaling and no serious difficulties were encountered in arranging track circuits to effect automatic control of the gates. A signal is located 58 ft. south of the crossing, so that the only additional track circuit needed was a short one over the crossing on the northward track to hold the gates down until the rear of a northbound train cleared the crossing, this feature being also in effect for southbound trains without additional track circuits because the existing signal and track location is south of the crossing. Some of the trains in regular service operate over this crossing at speeds as high as 90 m.p.h. Therefore, the control sections, extending 4,430 ft. to the south and 4,500 ft. to the north, start the warning 33 sec. and cause the gate to be fully lowered 18 sec. before the fastest train arrives at the crossing. The control to lower and raise the gates is effected by line and local control neutral relays in combination with stick relays.

Just south of the northward approach control section, 4,440 ft. from the crossing, there is a main-line switch which is often used. To prevent unnecessary delay to highway traffic on account of the gates being held down during such a switching operation, a special release arrangement was provided. The northward approach consists of two track sections, the southerly one of which, 2,800 ft. in length adjoining the switch, operates a thermal relay so adjusted as to raise the gates after a period of 1½ min. has elapsed, provided the train has not passed into the 1,630-ft. section next to the crossing and no other control section is accepted. When the train completes its switching movement and again proceeds toward the crossing, the 1,630-ft. track circuit effects operation of the gates in plenty of time for the protection of such a movement.

The relay and power supply equipment is housed in a large welded sheet-metal case located south of the crossing. The control equipment, including the relays, lighting transformers and copper-oxide rectifiers, was furnished by the General Railway Signal Company. The insulated wire and cables are of Okonite manufacture, while Exide storage batteries and Edison primary cells were used.

This installation of automatic crossing gates was planned and installed by the signal forces of the Chicago & North Western under the direction of the signal engineer.

Further Gains Reported in Railway Buying

Total for eight months of almost $600,000,000 includes $430,000,000 from manufacturers of equipment and materials

THE magnitude of the railroads as consumers and the growing rate of their purchases are again reflected by figures compiled by the *Railway Age*. In the first summaries for July and August and the eight months' period to September 1, it is disclosed that while the railroads of the United States still have a long way to go to equal the volume of their purchasing in the years previous to the depression, expenditures and orders for equipment and supplies were well sustained during the summer months, after the most spectacular rise in six years. Purchases from manufacturers are now averaging 60 per cent larger than in 1935 and over 100 per cent more than in 1933. These purchases are being financed out of current earnings.

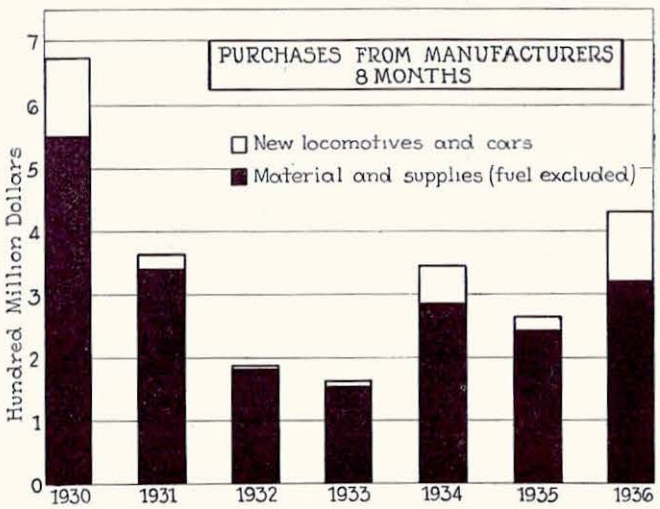
Based on the earliest returns for August, Class I railroads are estimated to have spent $45,860,000 with manufacturers in that month for materials and supplies, exclusive of new locomotives and cars, and $21,650,000 for fuel—a total of $67,500,000 for material and supplies and fuel, exclusive of equipment. This was more than was spent for materials and supplies and fuel in any month since May when the total was $69,040,000, and compares with $53,937,000 spent for materials and supplies and fuel in January of this year and $46,000,000 in August, 1935. The total in August, 1932, was only $30,000,000. Purchases of materials and supplies, exclusive of fuel and of equipment, from manufacturers in August, amounting to $45,860,000, compare with $32,767,000 last January and $30,440,000 in August a year ago. In August, 1932, purchases from manufacturers, exclusive of equipment, were only $19,000,000.

Railway Purchases—8 Months

	Materials and supplies ex. fuel (000)	New equip. (000)	Total from mfrs. (000)	Total inc. fuel (000)
1929	$647,701	$272,812	$920,513	$1,146,912
1930	548,446	124,462	672,908	882,862
1931	341,864	25,275	367,139	531,275
1932	187,700	1,942	189,642	307,642
1933	159,599	4,207	163,806	280,746
1934	287,590	60,102	347,692	485,757
1935	243,340	23,682	267,022	423,232
1936	341,577	88,987	430,564	597,003

Eight Months' Totals

During the eight months ending August 31, expenditures by the railroads for materials, supplies and fuel and the value of orders placed by them with equipment builders for new locomotives and cars reached the imposing sum of $597,000,000, according to present calculations. This includes $341,577,000 for materials and supplies purchased from manufacturers and $88,987,000 of equipment orders placed with manufacturers—a total of $430,564,000 of business placed with manufacturers. The remaining $166,439,000 went for coal and fuel oil. Heat, light, water and power purchased by the railroads and also materials purchased by contractors for railway construction work and materials purchased by transportation subsidiaries are not included in these totals.



A Comparison of Railway Purchases from Manufacturers

The purchases of materials and supplies, exclusive of fuel, from manufacturers and the orders placed with manufacturers for new locomotives and cars, aggregating $430,564,000 for the eight months' period, were larger by $173,500,000 or 61 per cent than the total for the corresponding eight months of 1935. They were larger by $83,000,000, or 22 per cent, than the totals for the first eight months of 1932 and 1933 combined, and they exceeded by approximately $65,000,000, or 18 per cent, the corresponding totals for the first eight months of 1931. However, the total business placed

Purchases of Material and Supplies—Class I Roads*

	Fuel		Rail		Cross Ties	
	1936 (000)	1935 (000)	1936 (000)	1935 (000)	1936 (000)	1935 (000)
January	$21,170	$20,800	$1,093	$965	$2,860	$2,080
February	23,554	21,050	2,390	1,540	2,266	2,300
March	21,619	25,500	3,975	1,590	3,155	3,240
April	20,089	18,000	5,254	1,780	3,707	4,060
May	18,879	18,400	5,566	2,140	3,974	3,440
June	18,526	21,050	3,875	1,700	4,293	3,200
July	20,952	15,850	2,088	2,120	4,499	3,420
August	21,650	15,560	2,100	1,060	1,750	3,100
8 Mos.	166,439	156,210	26,341	12,895	26,514	24,840

	Other Material		Total		Total less fuel	
	1936 (000)	1935 (000)	1936 (000)	1935 (000)	1936 (000)	1935 (000)
January	$28,814	$21,605	$53,937	$45,450	$32,767	$24,650
February	28,287	21,310	56,498	46,200	32,944	25,150
March	35,519	26,420	64,269	56,750	42,650	31,250
April	38,217	29,360	67,269	53,200	47,180	35,200
May	40,620	27,220	69,040	51,200	50,160	32,800
June	37,325	26,800	64,021	52,750	45,494	31,700
July	37,933	26,610	65,475	48,000	44,522	32,150
August	42,000	26,280	67,500	46,000	45,850	30,440
8 Mos.	288,715	205,605	508,009	399,550	341,577	243,340

* Subject to revision.

with manufacturers up to September 1, this year, as reflected by the above totals, was 52 per cent less than the corresponding business placed with manufacturers during the first tight months of 1929.

The value of orders placed with equipment builders for new locomotives and cars during the first eight months of this year, amounting to $88,987,000, fell well below the corresponding figures for 1929 and 1930, but was almost four times the value of orders placed in the first eight months of 1935. It exceeded by $5,000,000 the totals for the eight months' periods of 1934 *and* 1935 combined, and came within $24,000,000 of equaling the totals for the first eight months of all the previous five years combined.

Purchases—Materials and Fuel—7 Months

	July 1936	July 1935	7 Months 1936	7 Months 1935
Alton	$500,895	$504,933	$2,816,448	$2,089,572
Alton & Sou.	12,262	16,294	180,036	113,562
Ann Arbor	63,333	56,138	553,567	511,033
A. T. & S. F.	3,146,075	1,942,837	23,194,964	15,934,181
A. B. & C.	70,315	84,676	460,067	472,870
A. C. L.	965,140*	631,395	5,931,320*	4,972,088
B. & O.	3,299,399*	1,435,063	17,026,429*	11,611,534
Bang. & Aroos.	43,809	65,217	886,226	956,590
Bing. & Gar.	9,887	2,651	127,691	90,152
B. & M.	630,582	538,323	4,461,754	4,348,935
Camb. & Ind.	11,341	7,822	81,394	67,983
Cent. of N. J.	435,948	302,649	3,068,090	2,698,052
Cent. Vt.	154,777	117,955	907,600	931,355
C. & W. C.	48,576*	23,045	302,966*	299,088
C. & O.	1,332,603	782,271	9,666,398	6,969,445
C. & E. I.	162,269	251,471	1,928,971	1,494,424
C. & I. M.	33,777	40,486	302,520	313,489
C. & N. W.	1,956,211	1,223,049	14,206,638	9,255,937
C. B. & Q.	1,941,304	1,216,064	11,440,948	9,338,506
C. G. W.	420,076	356,505	2,055,633	2,636,518
C. I. & L.	129,088	87,217	957,363	636,325
C. R. I. & P.	1,592,895	1,141,177	10,300,471	7,318,803
C. St. P. M. & O.	392,126	290,970	2,702,156	1,988,731
Clinchfield	94,637	68,564	657,071	610,427
Col. & Green.	21,406	17,969	160,148	122,960
D. & H.	481,942	427,573	3,212,112	3,420,833
D. L. & W.	643,373*	435,043	5,260,926*	4,885,289
D. & T. S. L.	24,078	No data	325,478	No data
Det. & Mack.	21,843*	7,881	114,535*	100,874
D. T. & I.	66,754	36,876	599,490	725,175
D. M. & N.	146,589	101,126	1,240,797	774,298
D. S. S. & A.	41,345	29,076	288,027	262,921
E. J. & E.	195,565	122,437	1,478,937	1,086,660
Erie	1,211,639	1,132,832	7,958,578	7,199,679
F. E. C.	96,317	110,295	952,479	967,373
Ft. S. & W.	10,553	8,100	70,215	56,809
G. N.	1,612,362	984,916	8,472,100	7,152,429
I. C.	1,707,780	1,643,164	11,519,035	9,945,851
K. C. S.	414,776*	126,090	1,740,665*	928,369
K. C. Term'l.	63,237	65,751	454,830	414,391
L. S. & I.	9,591	9,558	90,277	87,737
L. & N. E.	60,345	54,744	406,375	307,399
L. V.	877,809*	No data	5,884,015*	No data
L. & A.	82,753	74,074	820,715	602,053
L. & N.	984,734	510,017	9,003,186	6,615,507
Me. C.	211,846	105,652	1,691,541	1,456,551
M. St. P. & S. S. M.	605,006	396,284	3,129,631	2,630,437
Mo. Pac.	2,351,680	1,849,686	15,426,081	11,844,734
M. & O.	166,855	114,544	1,162,318	906,605
Monong.	37,508	34,952	249,645	222,555
Montour	25,046	No data	194,991	No data
N. C. & St. L.	265,909	165,751	1,963,392	1,466,824
Nev. Nor.	11,476	6,699	79,079	57,714
N. Y. C. Sys.	5,755,533*	3,895,949	42,367,791*	32,348,170
N. Y. C. & St. L.	604,606	339,740	4,027,505	2,648,636
N. Y. N. H. & H.	1,035,165	994,400	7,636,284	6,231,713
N. Y. O. & W.	139,709	143,574	967,483	1,078,284
N. W. P.	26,198	26,230	237,653	186,772
Penna. & L. I.	5,276,743	3,643,866	36,692,970	27,669,321
Pa.-Read. SS	45,416	45,605	242,714	240,970
P. & P. U.	24,885*	23,852	343,752*	182,763
P. M.	524,873	380,991	3,635,020	2,972,751
P. & S.	10,401	2,709	58,940	87,619
P. & W. Va.	52,483*	25,596	335,410*	205,911
P. S. & N.	20,109	19,698	94,948	105,704
Reading	711,106*	472,800	4,922,751*	4,472,008
R. F. & P.	83,080	127,663	1,010,213	960,286
Rutland	314,505	143,574	629,619	1,078,284
St. L.-S. F.	811,517	858,329	6,357,010	5,862,747
St. L. S. W.	297,746	137,457	2,305,423	1,152,064
S. A. L.	686,077	496,571	5,384,902	3,975,555
Southern	2,008,019	1,503,642	12,878,241	11,002,942
S. P. Pac. Sys.	2,462,600	1,502,130	16,485,943	11,569,754
S. P. & S.	121,319	86,353	1,009,355	647,339
Term'l of St. L.	160,768	98,666	947,501	729,028
Tenn. Cent.	47,279	25,213	309,179	228,073
T. & N. O.	675,282	439,630	4,806,751	3,019,816
T. & P.	493,718	370,538	3,568,306	2,317,914
U. P. Sys.	3,426,385	3,270,959	20,768,482	15,841,021
Utah	6,863	4,424	84,862	58,531
Virginian	259,623	117,461	1,888,859	945,723
Wabash	693,947	644,343	5,120,962	3,798,092
W. Md.	249,491	201,793	1,957,904	1,852,727
W. P.	443,300	509,900	4,060,500	2,276,950
W. & L. E.	303,189	220,534	1,856,252	1,946,307

* July estimated.

Purchases of materials from manufacturers, exclusive of equipment, for the eight months, were larger by approximately $98,000,000, or 40 per cent, than the corresponding purchases in 1935, and were double the corresponding purchases in 1933. There was an increase of approximately $14,000,000, or 100 per cent, in the purchases of rail during the eight months of this year, as compared with the first eight months of 1935, an increase of approximately $2,000,000, or 6 per cent, in the expenditures for crossties, and an increase of approximately $83,000,000, or 40 per cent, in the purchases of repair parts for locomotives and cars and for miscellaneous material.

Increases in All Sections

From all sections of the country come the reports of increased railway buying. It is too early for the complete comparative details of all roads for an eight months' period, but comparative figures for seven months disclose increases in the purchases of materials and supplies and fuel, exclusive of equipment, on 70 out of 80 reporting companies. On the St. Louis Southwestern and the Virginian, purchases, exclusive of equipment, for the first seven months of the year were double the expenditures made in the corresponding period of 1935. The increase was 53 per cent on the C. & N. W., 50 per cent on the C. I. & L., 60 per cent on the D. M. & N., 87 per cent on the K. C. S., 52 per cent on the N. Y. C. & St. L., 63 per cent on the P. & W. Va., 56 per cent on the S. P. & S., 59 per cent on the T. & N. O., 54 per cent on the T. & P., and 78 per cent on the Western Maryland. There were also increases of 45 per cent on the A. T. & S. F., 47 per cent on the B. & O., 39 per cent on the C. & O., 22 per cent on the C. B. & Q., 41 per cent on the C. R. I. & P., 36 per cent on the E. J. & E. and L. & N., 34 per cent on the N. C. & St. L., 22 per cent on the N. Y. N. H. & H., 33 per cent on the Pennsylvania, 22 per cent on the Pere Marquette, 35 per cent on the S. A. L., 31 per cent on the Union Pacific and 35 per cent on the Wabash.

Industrial Traffic Managers Present Transportation Needs

TRAINLOAD rates, faster service and intelligent solicitation were cited as essential transportation requirements for present day merchandising by six traffic managers of large industries who discussed the problem of purchasing transportation at a luncheon of the Traffic Club of Chicago on September 24. While the subject under discussion was purchasing transportation, these men, Murray N. Billings, traffic manager of the United States Steel Corporation subsidiaries; John W. Bingham, traffic manager of the Corn Products Refining Company; George A. Blair, general traffic manager of Wilson & Company; J. A. Brough, assistant secretary and traffic manager of the Crane Company; R. W. Campbell, manager of the traffic department of the Butler Paper Corporation, and L. E. Muntwyler, general traffic manager of Montgomery Ward & Company, directed most of their remarks to railroad service.

Mr. Billings, whose subject was price, opened the discussion by outlining the development of competitive transportation. "It is only a short time ago," he said, "that rail transportation had a practical monopoly, both

as regards rates and services. The highways, waterways and airways were here, but not as real competitors in the minds of the railways. Almost overnight these so-called playthings took their place as real factors in the transportation world. It was discovered that the public demanded a door-to-door service, and the rail carriers were not prepared to meet this demand. The railways also discovered that the speed of motor vehicles was such that they had a major problem in service to solve.

"At the same time the railways discovered that the rigid regulation that bound them did not apply to highway or waterway traffic, and hysteria and panic became the order of the day. Sweeping reductions in rates were put into effect in frantic efforts to regain or hold traffic to the railways. The fly-by-night truck appeared on the scene and the legitimate truck found itself in a helpless position. Congress and the states have now placed regulation on the motor vehicles and the commissions are trying to apply it.

"Because of these developments during the last few years, it is high time the railways gave deep and active thought to the transportation situation, with the idea of adopting better systems for making rate changes. Industrial traffic managers and representatives of commercial organizations have borne down harder and harder, demanding a speed in transportation that has reversed the cost stream and costs are now on the upgrade. Freight trains are now being operated on passenger train schedules, and the end is not yet in sight.

"If all industry was keyed to operate on a basis comparable with the speed demanded of, and given by, transportation, the volume of goods produced would be so great that, under present conditions, they could not be consumed. Are these interests that demand speedy service, including those that work direct from car or truck, willing to pay the price of the service? It will take sane thinking and a lot of courage to solve this problem.

"The railways found that in order to start making both ends meet they must have additional revenues. Emergency rates were put into effect and are now extended to the end of this year. Railways now find that they will require a large portion of these rates as a permanent part of their rate structure. The continuation of the emergency rates will indirectly help the trucks, which are finding, as regulation is applied to them, a great many rates of the railways difficult hurdles to jump. Mr. Railway Executive, why not try to help your revenues by the use of reduced trainload rates?"

Solicitation

In speaking on the subject, Why a Solicitor, Mr. Bingham said emphatically that the solicitor has a legitimate place in the sale of transportation, that he is a valuable adjunct to the railroad industry and a necessity to the shipping public. "The principal objective of a solicitor should be to establish and maintain an attitude of friendship with his customers. A solicitor ought to have a general knowledge of rate matters, including territorial descriptions, rate adjustments, classifications and exceptions to classifications, and should be particularly well informed about rules and regulations covering reconsignments, stop-offs and the charges therefore on his own road and in the territory in which he is interested; he should likewise be able to discuss demurrage rules, schedules of his trains, and the time required for movement through large switching yards and through connecting line junctions. He should try to inform himself of any rate proposals that are of particular interest to his customer; keep him informed of public hearings, and how rate matters are progressing through committees.

"He should, by all means, have available a record of the business moving over his road from the customer he is calling upon, especially if that customer has a volume of tonnage that is of some consequence. He should make a study of that tonnage as it moves from month to month and from year to year and if there is any notable increase or decrease, find out from the customer the reason therefore and be ready to explain it to his superior officers if necessary. A well-informed, aggressive, courteous solicitor is an ambassador of good will for a railroad."

Mr. Blair cited the volume of packing house products in relation to all traffic handled by the railways, and commended the railways for the service that is now being rendered through co-operation with these shippers. He urged that the close co-operation which has resulted in dependable and regular service be continued.

Merchandising Methods Changed

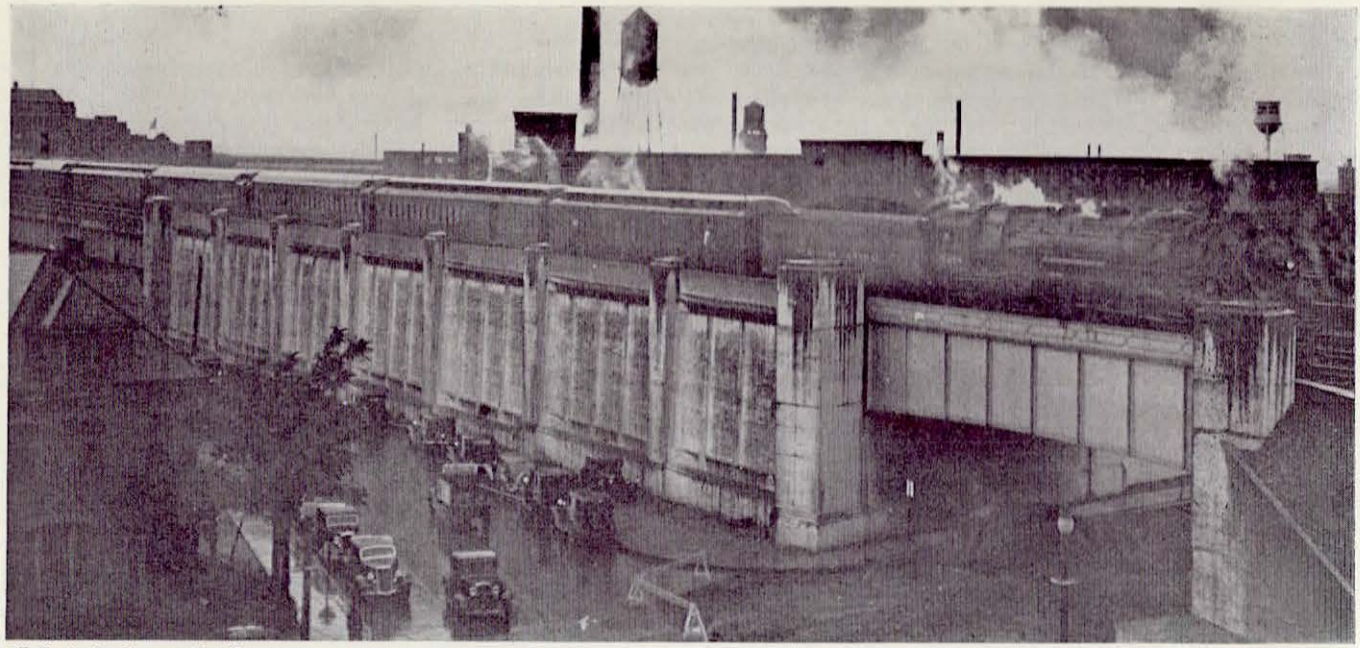
Mr. Brough traced the changes in merchandising methods since 1906, saying that as a result of the change in buying habits by jobbers and distributors the ratio of l.c.l. tonnage to carload shipments has increased steadily since 1921, and this trend may be expected to continue. Prior to 1921, he said, distribution was accomplished through jobbing centers and as a result most shipments moved in carload lots. The depression of 1921, he continued, with falling prices, proved unprofitable to jobbers and distributors who carried large stocks, and in order to protect themselves they adopted the policy of carrying little or no stock, thereby introducing an era of hand-to-mouth buying.

Fast transportation service, he said, has now become a necessity due to the competition among industries for the business of the consumer, for merchants realize that if the item asked for is not on the shelf when the customer asks for it he may spend his money elsewhere before the stock can be replenished. Because of these conditions, he said, the truck has been able to establish itself as an important factor in transportation, for it can make fast deliveries. In general, trucks will pick up shipments as late as 5:30 p.m., and frequently as late as 8 p.m., and make deliveries the following morning.

Silent Solicitors

Mr. Campbell contended there was room for refinements in solicitation, touching upon certain factors which he termed silent solicitors. He said that no railroad should solicit business without first checking its services and rates to make sure that they are not higher than those of its competitors, for the shipper is not interested in routes that do not offer him an advantage. He said that in many cases the blame for the loss of traffic should not be placed upon the solicitor, but upon the attitude of the officers, claim departments and others contacted during the course of business. He said that tariffs should have as few exceptions as possible, for shippers will choose the railroad with the least number of exceptions.

Mr. Muntwyler demanded greater speed, even though, he said, the railroads have shown remarkable improvement in their schedules during recent years. Because of the changed methods of merchandising during the last 25 years, shippers must have speed, and present speeds are not yet fast enough. The present seventh morning delivery from Chicago to the Pacific Coast should be reduced to fifth morning, and the present third morning delivery from New York to Chicago should be speeded up to second morning, he said.



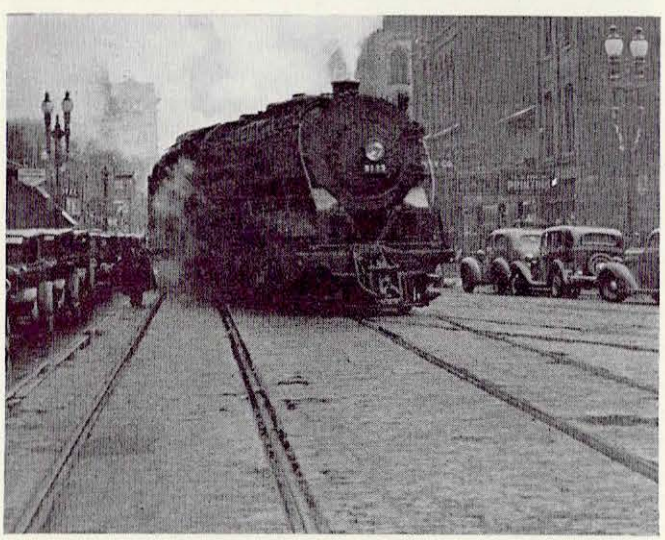
All Photos by Syracuse Herald

The Eastbound Empire State Express Proceeding Along the Elevation on Its Inaugural Run Into the New Station

No More Middle-of-the-Street Railroading for Syracuse

City celebrates opening of New York Central "elevation" which takes trains off main thoroughfares

SYRACUSE, N. Y., last week celebrated its passing as "the city where trains run along the main streets." With three nights of gay pageantry it hailed the opening of the "elevation" which marked the culmination of six years' work on the project for complete removal of New York Central and West Shore main line tracks from streets occupied under perpetual franchises granted as long ago as 1837. The celebration, designated the "Syracuse Jubilee," included a banquet sponsored by the Syracuse Chamber of Commerce; a 17-car excursion train over the new and old lines; "send-off" ceremonies for the last train out of the old station and greetings for the first into the new; and the street parade—a pageant depicting Syracuse's history, which was staged under the direction of Edward Hungerford on three nights, September 24, 25 and 26. Finally there was the coronation of the "Queen of the Jubilee"—Miss Annette Meatyard—who held court each of the three nights in Clinton square, where dancing in the streets followed the parade.



The Westbound Empire State Express Turning from Washington Street into the Old Station for the Last Time

The Syracuse project involved the elimination of 62 main-line grade crossings and the construction of a passenger station on Erie boulevard, approximately one mile from the old station on South Franklin street, which was built in 1895 and is now abandoned. A comprehensive description of the project will be published in an early issue of *Railway Age*.

The Jubilee observance got under way on the eve of the elevation's opening—Wednesday, September 23—when more than 1,000 persons attended the Chamber of Commerce dinner. Among the speakers were Mayor Rolland Marvin of Syracuse; Milo R. Maltbie, chairman of the New York Public Service Commission; and F. E. Williamson, president of the New York Central. President Williamson expressed to Mayor Marvin the railroad's "keen admiration for the initiative and interest that prompted this remarkable Jubilee celebration";

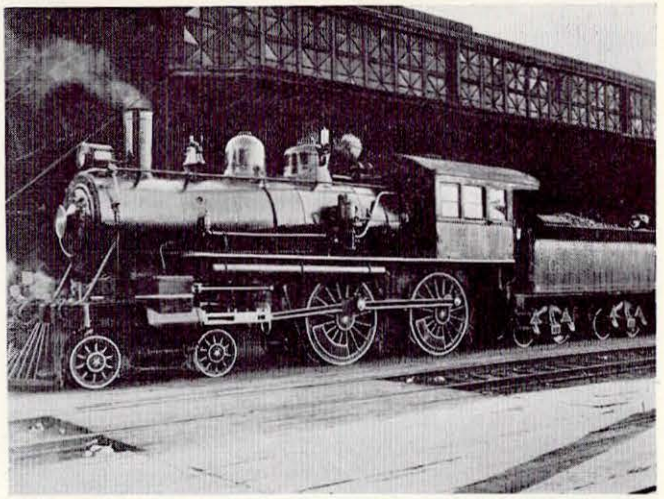
he had "never heard of anything like it on any similar occasion dedicating a railroad facility to public service." The whole project seemed to Mr. Williamson "like a dream, which at times threatened to transform itself into a nightmare; a nightmare to Syracuse on account of interference with street traffic and because of what seemed to be inaction; a nightmare to us from the standpoint of operation and particularly when we came to study the enormous expense of a solution."

Pointing out that the railroad's share of the $16,000,000 which the project cost will be $8,000,000, Mr. Williamson expressed the hope that "a future Legislature will so amend the grade crossing law that the railroads may be protected in such situations and their proportion of participation reduced to ratios that will be more equitable and more nearly commensurate with relative advantages." He closed with a tribute to all who had a part in the conception and consummation of plans for the project.

The dinner was a railroad affair. It was served by New York Central dining car crews, and conductors took up the tickets, which were in the form of railroad tickets. Also, the menu cards were in the form of timetables.

Thursday, September 24, was the big day, with the leading role assigned to the Empire State Express. Eastbound, this train, which had been operating through Syracuse's streets for 43 years, became the first regularly scheduled train to operate over the elevation into the new station. While the Westbound Empire was the official closer of the old line along Washington street—and was hailed as such—it was actually Eastbound Train No. 90 (the Forest City), which should have been out ahead of the Empire but which was some 18 min. late, that captured the honor of being the last to leave the old station and travel along Washington street. This was at 2:46 p.m. At 3:47 p.m. the Eastbound Empire drew into the new station which had been opened at noon as the starting point of the 17-car excursion train which carried Mayor Marvin and some 1,200 other celebrators over the new and old lines. These arrival and departure ceremonies were witnessed by huge throngs of people who crowded into the stations and lined Washington street, despite a more or less continuous rain which at times fell in torrents.

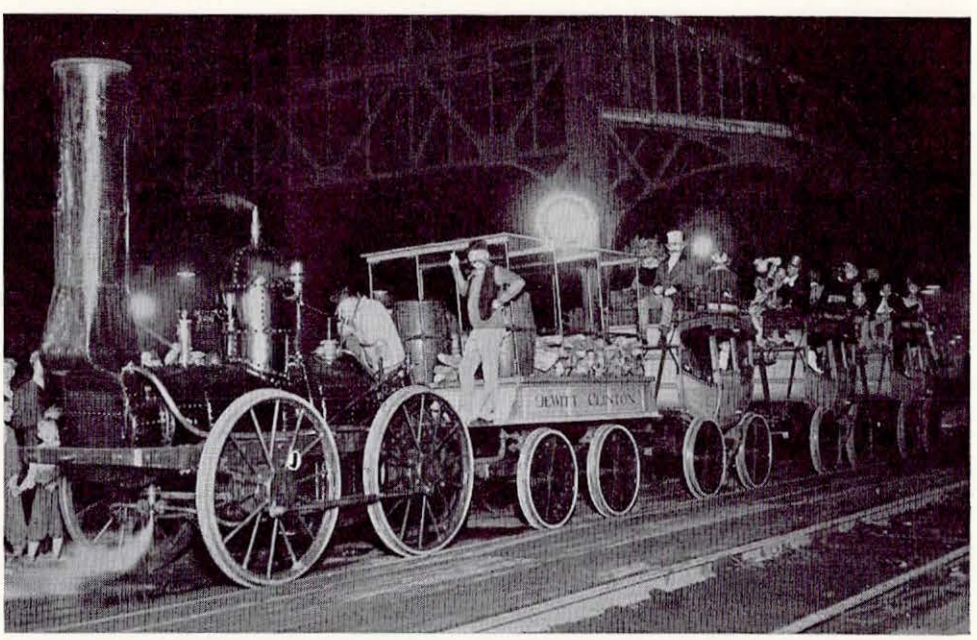
Also, despite the rain, the street parade went on as scheduled on Thursday night, to be repeated on Friday and Saturday under more favorable weather conditions. Washington street is what Mr. Hungerford described as "a natural" for a street pageant with a railroad angle. There the railroad units, running on the tracks, could be lined up in parade with highway units. The pageant was divided into four divisions—Historical; Americanization League; Municipal; and Industrial. The story of Syracuse and its railroads was unfolded in the Historical division; in the Americanization division were floats entered by various national groups among Syracuse residents; the Municipal division was a display of the activities and equipment of various city departments; the Industrial division was comprised of floats entered by business interests of Syracuse, and included a bus of the Central Greyhound Lines, New York Central affiliate, and trucks of the Keeshin Motor Express.



The "999," Famous Speed Locomotive Which Hauled the Empire State Express in the 'Nineties, Had a Prominent Place in the Pageant

Leading the parade's Historical division was a group of Indians, followed by a float showing Onondaga Indians with French soldiers and trappers and Father Le Moyne, discoverer of the salt wells around Syracuse. Next came in turn traders and trappers, a group of pioneers in a covered wagon, a circuit rider on a donkey and a stage coach.

With "the Syracuse of 1820" came the first packet boat on the Erie Canal and the De Witt Clinton train,



The DeWitt Clinton Train at the Old Station—Ready to Take Its Place in the Street Parade

which Mr. Hungerford had brought over from Cleveland, Ohio, where he is directing the transportation pageant at the Great Lakes Exposition. Syracuse of "the Forties and Fifties" saw the first train over the Syracuse & Utica enter the old station in Vanderbilt square on July 4, 1839. This train was reproduced for the parade by constructing passenger car bodies of the period on track cars which were hauled by the William Galloway, old B. & O. locomotive. "The Syracuse of the Sixties" was depicted by a float showing President Lincoln as he greeted the populace of Syracuse from the rear platform of the train on which he was en route to his first inauguration. Also, there was a carriage in which two early railroad magnates—Cornelius Vanderbilt and Dean Richmond—were riding with Andrew D. White, Syracuse's first citizen of the time.

The railroad's role in "the Syracuse of the Nineties" was epitomized by the famous speed locomotive—the 999—which Charles Hogan drove on the New York Central, west of Syracuse, at the rate of 112.5 m.p.h.—a record to stand for many years unbroken. Charlie Hogan was again at its throttle as the "999" rolled along Washington street in the parade. And finally, "Twentieth Century Syracuse" saw a troop train filled with soldiers on their way to the World War, followed by the New York Central's new streamlined locomotive, the Commodore Vanderbilt, which steamed along alone—the last unit in the parade's Historical division.

Then followed the other divisions listed in the foregoing, the pageant closing with the float bearing the queen and her court. The crowd next flocked to Clinton square, where the bands played "I've Been Workin' on the Railroad." And a taxicab driver remarked: "It's gonna be hard to get used to not lookin' out for them trains."

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading for the week ended September 19 totaled 789,510 cars, reaching a new peak for the year and again exceeding the corresponding 1931 figure. This was an increase of 89,651 cars as compared with the preceding week, which included the Labor Day holiday, and an increase of 82,690 cars, or 11.7 per cent, as compared with the corresponding week of last year. It brings the cumulative total for the year to 25,371,522 cars, an increase of 13.1 per cent as compared with the corresponding period of 1935. Loading of grain and grain products showed a decrease of 9,474 cars under last year's figures but all other commodity classifications showed increases. Miscellaneous freight showed an increase of 55,077 cars. The summary, as compiled by the Car Service Division of the Association of American Railroads follows:

Revenue Freight Car Loading

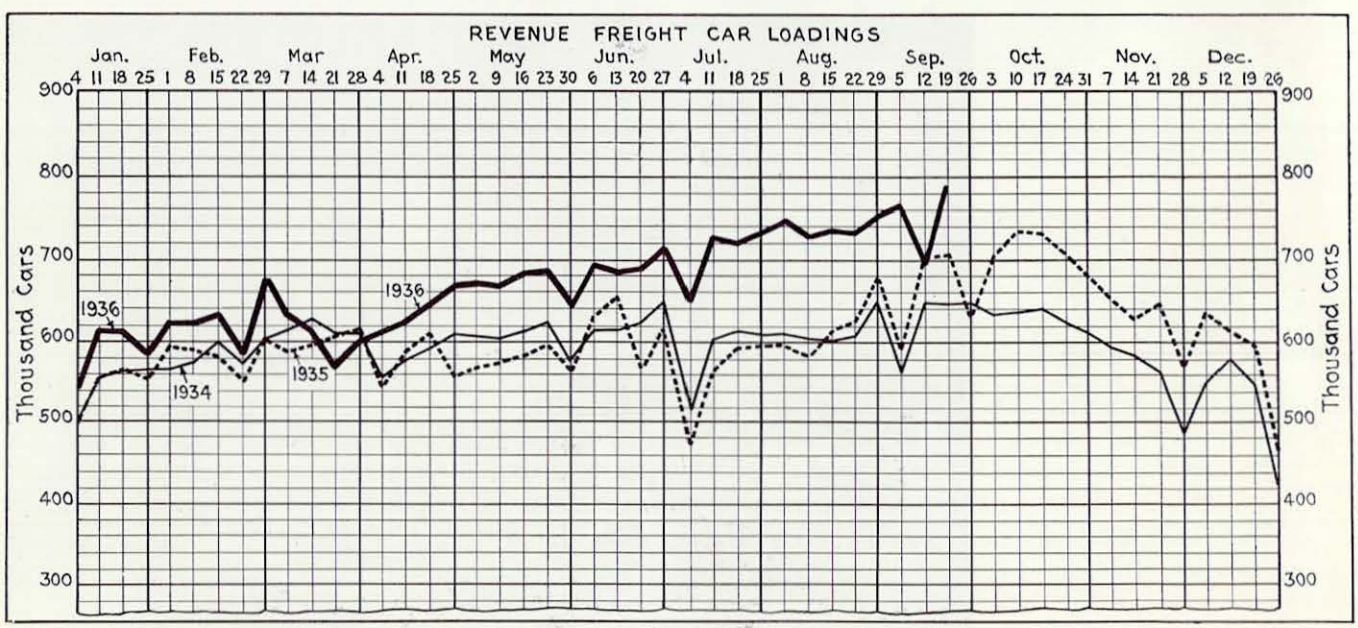
For Week Ended Saturday, September 19

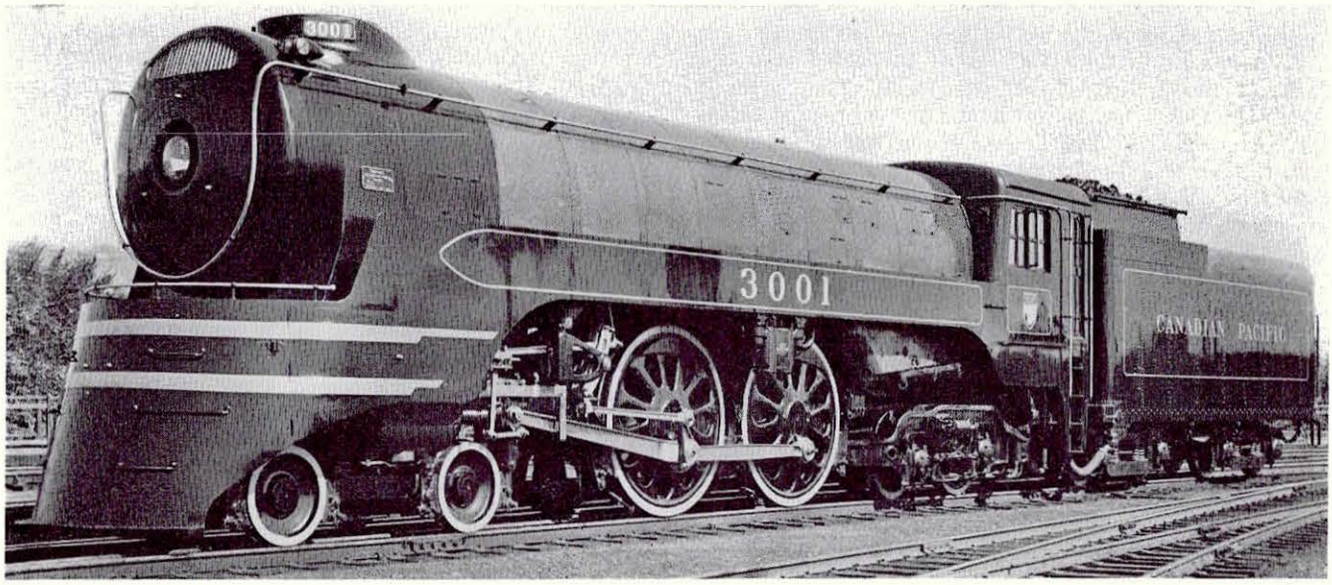
Districts	1936	1935	1934
Eastern	155,514	145,740	133,758
Allegheny	159,458	132,283	115,620
Pocahontas	55,394	49,256	43,448
Southern	110,522	101,854	88,516
Northwestern	127,219	112,829	99,509
Central Western	116,491	105,979	105,465
Southwestern	64,912	58,879	58,182
Total Western Districts	308,622	277,687	263,156
Total All Roads	789,510	706,820	644,498
Commodities			
Grain and Grain Products	33,075	42,549	32,965
Live Stock	18,738	18,534	32,248
Coal	136,986	133,079	121,439
Coke	9,856	6,440	5,291
Forest Products	35,452	33,076	23,115
Ore	59,232	37,364	24,226
Merchandise L.C.L.	170,423	165,107	164,082
Miscellaneous	325,748	270,671	241,132
September 19	789,510	706,820	644,498
September 12	699,859	699,786	647,485
September 5	764,680	591,941	563,883
August 29	753,742	680,848	647,531
August 22	734,973	625,774	606,917
Cumulative Total, 38 Weeks	25,371,522	22,482,149	22,716,368

Car Loading in Canada

Car loadings in Canada for the week ended September 19 totaled 59,661, the highest point reached in five years, according to the Dominion Bureau of Statistics. The total compares with 56,018 in the similar week last year, and 52,909 for the preceding week this year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
September 19, 1936	59,661	22,675
September 12, 1936	52,909	19,427
September 5, 1936	58,512	22,083
September 21, 1935	56,018	20,596
Cumulative Totals for Canada:		
September 19, 1936	1,729,187	869,557
September 21, 1935	1,660,982	801,673
September 22, 1934	1,648,910	829,664





Canadian Pacific Passenger Locomotive for Light High-Speed Passenger Service

C.P.R. Buys Streamline Steam Locomotives

Five high-speed units of 4-4-4 type are for service with new light passenger cars

ON July 27 the first of five semi-streamline locomotives for high-speed passenger service was delivered by the Montreal Locomotive Works, Ltd., to the Canadian Pacific. The railroad has since received the remaining four locomotives of the order. They will be used to haul trains made up of new steel passenger coaches, the weight of which has been kept low by careful designing.

The locomotives are of the 4-4-4 type and have a total weight of 263,000 lb., of which 120,000 lb. is on the driving wheels. The diameter of the drivers is 80 in. The cylinders are 17¼ in. by 28 in. and the boiler pressure, 300 lb. per sq. in. The locomotives develop a tractive force of 26,500 lb.

The streamlining consists of a cowl which completely encloses the boiler and smokebox back to the cab, with a heavily reinforced sloping shroud around the front end below the smokebox which serves as a pilot and extends around the sides to enclose the steam chests and cylinders. This is relieved by two horizontal stripes of polished metal, which conform in appearance to the polished steel of the rods and motion work. Skirts extending about 2 ft. below the running boards along the sides of the boiler conceal the piping, the reverse gear, an air reservoir on each side and (partially) the air compressor and the feedwater pump. At the rear end these blend into the sides of the cab. The front corners of the cab are rounded. Otherwise, it is of the standard vestibule construction in general use on the Canadian Pacific. The running boards are supported from the frames, except at the rear where they are fitted with a sliding support from the sides of the firebox. The front end of the engine is so designed that the coupler can be folded up when not in use and covered with a light removable panel. The hand-rail posts are of the Blunt type which provide for quick removal and replacement of the hand rail.

In finish the locomotive presents a striking appearance. The cowling about the smokebox and around the front end, and the sides and front of the cab, are finished in black. The remainder of the cowling over the boiler is in planished steel. On a black field along the skirting around the running board is a wide band of Tuscan red, the standard coach color of the Canadian Pacific, which is separated from the black border by a stripe of gold. Below each cab side window is a panel of Tuscan red on which the Canadian Pacific shield is painted in colors. A large panel of Tuscan red on black is also employed on each side of the tender. The numbers and lettering are in gold.

The boiler is of the conical type with three shell courses of nickel steel. The first course is 68 in. in inside diameter, the second course is conical, and the third, 75 in. in outside diameter. The firebox sheets and staybolts are also of nickel steel. There is no combustion chamber. The boiler is built without a steam dome. An inside dry pipe gathers steam through a series of circumferential slots in the top surface. These slots have a combined area which is approximately twice the cross-sectional area of the dry pipe. Steam entering the dry pipe is so directed that it rises over a sufficiently large water-surface area to prevent the lifting of the water and to effect a much steadier level of the water in the water glass. This form of dry pipe has been developed

as the result of experience during recent years on some of the largest locomotives on the Canadian Pacific.

A manhole through the top of the third course in front of the firebox is furnished with a flat cover on which the safety valves are mounted. Threaded safety-valve connections have been replaced on this road by bolting flanges with flat ground joints in order to overcome the frequent distortion of the valve seats from too severe use of the wrench. The whistle, which also has a flange base, is studded to the boiler shell immediately back of the manhole ring. The steam connection is by pipe to the side of the whistle base from the superheated-steam turret.

In the fabrication of the boiler shell nickel-steel rivets have been used for the first time in order to secure a higher shearing value and to provide a better balanced seam in the high-tensile plate.

There are four arch tubes in the firebox. At the throat ends these are rolled and beaded into ported forged-steel sleeves which extend through the water space and are threaded and welded to the inside and outside sheets. These have been used with success for some years on the Canadian Pacific. The grates are of the Rosebud or pin-hole type and are of chromite heat-resisting steel. The side bars are closely fitted against the side sheets and the usual deflector plates are applied at the mud ring under the side carriers to deflect cold-air currents inward and to prevent them from sweeping directly up along the side sheets. This has prevented trouble from firebox side sheets cracking. The ashpan hopper and door are of cast steel, while the body of the pan is of plate construction. Drop side doors at the top of the ash pan facilitate cleaning and inspection.

The boilers are fitted with the Type E superheater, in the header of which is included the American multiple throttle. The Elesco feedwater heater is mounted in a deep recess in the top of the front end of the smokebox. The steam connections between the cylinders and the heater are installed with gland-packed slip joints where the pipes are attached to the cylinders. This arrangement has overcome the considerable difficulty formerly experienced with failures of these pipes from expansion and contraction stresses. The front end is fitted with a barrel type of netting, oval in horizontal cross-section. The netting fits into grooved castings at the top and bottom and may be readily removed.

The stack and stack cowling form the only projection above the surface of the cowling over the boiler. The stack is of the inside extension type and at the top is enclosed by a streamline casing, the top of which is flush with the top of the stack and in which is the smoke-lifter air passage and numeral light.

The frames are of nickel cast steel, joined at the front by a steel deck casting, at the rear by a General Steel Castings cradle. The crosstie casting between the two pairs of drivers not only serves as a vertical crosstie and horizontal brace for the frames, but also extends upward at the ends to provide brackets for the 8½-in. cross-compound air compressor on the right side of the locomotive and the Elesco feedwater pump on the left side. These two pieces of equipment are thus placed in balance with each other and the boiler shell is relieved of the stresses caused by their direct attachment to the boiler. Both are readily accessible, removable panels being provided in running-board skirts for this purpose.

The four-wheel engine and trailing trucks are of General Steel Castings design. Both are fitted with SKF roller bearings.

The driving-wheel centers are Boxpok type mounted on axles of carbon steel, fitted with journal boxes of the crown-brass type. The rods are of the tandem type, and the distance between cylinder centers has been kept down to 77 in. Crank pins are of low-carbon nickel steel with 2.5 per cent nickel and 0.20 to 0.27 per cent carbon, double heat-treated. The rods are quenched nickel-steel forgings with 0.32 per cent carbon and 2.5 per cent nickel.

Both pairs of main wheels are cross-counterbalanced, although, because of the reduced cylinder spread, the amount of cross-balancing necessary was greatly reduced. Contrary to the general practice in cross-counterbalancing the Canadian Pacific does not use an offset balance weight, preferring to employ a supplementary weight set at 90 deg. to the main balance weight. In this way the balance can be readily adjusted in the event of any change in the rods or crank pins.

The cylinders are nickel iron castings and are thoroughly lagged. The guides and crossheads are of the single-bar Dean type. The locomotives are equipped with Walschaert valve motion and Barco Type B-4 power reverse gear. The valves are 9 in. in diameter and have a maximum travel of 6½ in.

The general arangement of parts usually mounted on the boiler, with the exception of the bell, has not been greatly disturbed by the application of the lagging. The feedwater heater, the smoke stack, sand boxes, top boiler check, safety valves, whistle and steam turret are in the customary locations. The bell, however, is located on the left back steam chest cover just under the running board, and one of the three air reservoirs has been placed on the deck casting under the front end of the smokebox.

General Dimensions and Weights of the Canadian Pacific 4-4-4 Type Locomotives

Railroad	Canadian Pacific
Builder	Montreal Loco. Works
Type of locomotive	4-4-4
Road class	F-2-a
Road numbers	3000—3004
Date built	1936
Service	Passenger
Rated tractive force, engine, 85 per cent, lb.	26,500
Weights in working order, lb.:	
On drivers	120,000
On front truck	68,000
On trailing truck	75,000
Total engine	263,000
Tender	198,500
Wheelbases, ft. and in.:	
Driving	7—8
Total engine	27—3
Engine and tender, total	70—8¾
Driving wheels, diameter outside tires, in.	80
Cylinders, number, diameter and stroke, in.	2—17½ x 28
Valve gear, type	Walschaert
Valves, piston type, size, in.	9
Maximum travel, in.	6½
Boiler:	
Steam pressure, lb.	300
Diameter, first ring, outside, in.	69 7/16
Firebox length, in.	114 1/16
Firebox width, in.	70 3/16
Arch tubes, number and diameter, in.	4—3½
Tubes, number and diameter, in.	47—2¼
Flues, number and diameter, in.	120—3½
Length over tube sheets, ft. and in.	19—0
Fuel	Bituminous
Stoker	Standard Type BK-1
Grate area, sq. ft.	55.6
Heating surfaces, sq. ft.:	
Firebox	198
Arch tubes	34
Firebox, total	232
Tubes and flues	2,601
Evaporative, total	2,833
Superheating (Type E)	1,100
Comb. evap. and superheat	3,933
Tender:	
Style	Rectangular
Water capacity, Imperial Gal.	7,000
Fuel capacity, tons	12
Trucks	Four-wheel

The headlight generator set has been placed on the back deck casting under the floor of the cab, and the exhaust piped up through the cab to the roof. Two of the locomotives are equipped with Stone-Franklin and three with Pyle-National sets. All are 32-volt, a.c. generators.

The locomotives are equipped with Westinghouse No. 8ET air-brake equipment with the engineer's brake valve and feed valves pedestal mounted. The engine and tender are equipped throughout with clasp brakes, with the exception of the lead wheels on the trailing truck, each of which has a single brake shoe.

The tender is of the rectangular type, built up on a General Steel Castings water-bottom underframe. It is carried on two four-wheel trucks fitted with SKF roller bearings. The top of the tender back of the coal space is curved in at the sides to conform with the contour of the new passenger coaches with which the locomotives will be operated. The engine-tender connections include the Franklin Type E-1 radial buffer and Unit Safety type drawbars of forged nickel steel.

Recommends Certificate and Permit for P. R. R. Affiliate

WASHINGTON, D. C.

EXAMINER D. C. DILLON, of the Interstate Commerce Commission, in a proposed report made public on September 30, has recommended that the commission grant the application of the Pennsylvania Truck Lines, Inc., an affiliate of the Pennsylvania Railroad, for a certificate authorizing continuance of its operations as a common carrier and also for a permit to continue operations as a contract carrier for the Pennsylvania and Monongahela railways, by reason of bona fide operations on July 1, 1935, and continuously since that date. The examiner finds that dual operations as a common carrier and as a contract carrier of the same commodities in the same territory is consistent with the public interest and with the policy declared in Section 202(a) of the motor carrier act, and also discusses a number of the controversal questions raised in the collection and delivery case. Counsel for protesting truck lines had contended that authority to conduct such dual operations should be denied. The examiner also finds that the transportation of liquor from warehouse to liquor stores in Pennsylvania, pursuant to written agreement, is intrastate commerce and that no federal authority is necessary. The examiner says in part:

The examiner is of the opinion that applicant is a contract carrier when it transports freight between depots for a rail carrier over a highway which is parallel to the railroad's line. However, a contract carrier performing such service should ascertain whether or not the rail carrier has authority, pursuant to the provisions of the Motor Carrier Act, 1935, to ship freight by motor vehicle between such points. Section 203(a) (14) of the act expressly provides that a "common carrier by motor vehicle" shall include motor vehicle operations of carriers by rail, except to the extent that these operations are subject to the provisions of part I of the Interstate Commerce Act. A certificate of public convenience and necessity authorizing rail operations between certain points does not authorize motor-vehicle operations over the highways between the same points.

The records of the Commission disclose that the Monongahela Railway Company has duly filed its application for a certificate of public convenience and necessity authorizing the continuance of motor-vehicle service in lieu of rail service on its line in Pennsylvania and West Virginia. There is no application of the Pennsylvania Railroad Company for authority to carry on any motor-vehicle operations pending with the Commission. Under the circumstances the permit to which applicant is entitled by reason of past operations may be subject to revocation, as provided in section 212(a) of the act, for violation of the provisions of section 222(c) thereof.

The collection and delivery service is performed by applicant under written contract with the railroads and pursuant to oral agreements with the carloading companies. It performed such service for the Pennsylvania Railroad and the Monongahela Railway in Pittsburgh and vicinity.

There is no obligation, imposed by law, on the part of a common carrier by railroad to effect store-door collection and delivery of freight. However, rail carriers may grant such service to their patrons as part of their transportation service and may employ motor carriers to act as their agents in the actual collection or delivery. The contract of agency between a line-haul carrier and a carrier performing terminal service for such line-haul carrier does not affect the status of the terminal carrier as a common carrier or a contract carrier. An agent performing a transportation service undertaken by a common carrier may at the same time be a common carrier in its own right as to the same service. The character of the terminal carrier must be determined from all of its operations and their relation to the public.

The collection and delivery service performed by applicant is identical with the service performed for shippers who employ it to transport their goods to or from a freight station. The transportation of freight for the carloading company is identical with the service performed for the public in Allegheny County. The transportation for the general public is comparable to freight transported at local rates by a line-haul carrier and that for the railroads and carloading companies is comparable to freight service performed by a connecting line for which it is compensated on the basis of an agreed division of the joint through rate.

The examiner is of the opinion that the collection and delivery service performed by applicant is a part of its common carrier operations and that authority for such operations will be included in a certificate of public convenience and necessity granted applicant to transport commodities generally interstate commerce in Pittsburgh and Allegheny County.

All of the transportation services hereinbefore described were performed by applicant prior to June 1, 1935, and have been carried on continuously since that date. The only points beyond Allegheny County to or from which there is evidence of record that specific shipments have been transported by applicant are Altoona, Pa., Baltimore, Md., Weirton, Newell, and McMechen, W. Va., and Steubenville and Cincinnati, Ohio. A witness for applicant stated that the shipments shown in the record were selected at random from the files of applicant and are typical of its operations and that applicant has held itself out to the public to perform similar transportation to any points in the States of Pennsylvania, Ohio, West Virginia, and Maryland. Any authority granted applicant to continue irregular-route common-carrier service should authorize operations in specific territories but should not be confined to specific points.

The contract carrier operations of applicant are only partially performed in the same territory as its common carrier operations, and it does not appear that any shipper will be prejudiced by the continuance of both operations. The granting of both a certificate of public convenience and necessity as a common carrier and a permit as a contract carrier will be consistent with the public interest and with the policy declared in section 202(a) of the act.

The examiner finds that the applicant on June 1, 1935, was, and continuously since that date, has been in bona fide operation as a common carrier by motor vehicle over irregular routes in interstate commerce of commodities generally in any quantity between points in Allegheny County, Pennsylvania; in truck loads, minimum 2,000 pounds, from one consignor to one consignee, between Pittsburgh and points within a radius of 50 miles of the City-County Building in Pittsburgh; in truck loads where special handling is necessary or where emergency service is required between Pittsburgh and all points in the States of Pennsylvania, Ohio, West Virginia, and Maryland; and as a common carrier by motor vehicle over a regular route in interstate commerce between Pittsburgh and Cleveland; that it has complied with the provisions of section 206 of the Motor Carrier Act, 1935, and by reason thereof is entitled to a certificate authorizing the continuance of such operations. The examiner further finds that applicant on July 1, 1935, was, and continuously since that date, has been in bona fide operation as a contract carrier by motor vehicle in interstate commerce of commodities generally between points in the State of Pennsylvania served by the Pennsylvania Railroad Company and the Monongahela Railway Company; that it has complied with the provisions of section 209 of the Motor Carrier Act, 1935, and by reason thereof is entitled to a permit authorizing the continuance of such operation. It is recommended that the appended order be entered.

Roadmasters Held Profitable Convention at Chicago

Abstracts of additional papers and reports presented at the fifty-first annual convention

Part II

ABSTRACTS of the opening addresses, two committee reports and three papers which were presented at the convention of the Roadmasters and Maintenance of Way Association at the Hotel Stevens, Chicago, on September 15-17, were published in the *Railway Age* of September 26. Other features of this meeting are reviewed below. These include committee reports on Factors that Determine When Rail Should be Relaid, on Rail Lubricators, and on the Use of Work Equipment, and papers by C. B. Bronson, inspecting engineer, New York Central, New York, and John Foley, forester, Pennsylvania, Philadelphia, Pa. Abstracts of these are presented below:

Improvements in Rail Manufacture

By C. B. Bronson*

In a paper on the general subject of rails, Mr. Bronson reviewed current improvements in the processes for rail manufacture and offered a variety of suggestions concerning procedure in rail laying and in the upkeep of the tracks that would tend to prevent injury to the rails or unnecessary loss of service life. The portion of Mr. Bronson's paper relating to recent developments in rail manufacture is abstracted below:

We have entered a new era in railroad transportation which has been signalized by three spectacular innovations—streamlining, air-conditioning and shortened schedules—which spell comfort and speed in the movement of passengers and commerce. Fortunately, progress has kept pace with maintenance methods, in fact, much of this progress, particularly the intensive research work in connection with rail manufacture, antedates the new era in railroading. We might pause to consider what is going on in rail manufacture, and to touch on some points of which you will hear more as time goes on.

First, there is controlled cooling. The process is simple and involves the placing of groups of 100 rails, initially at 1,000 deg. F., in covered metal boxes, and cooling them to about 300 deg. in roughly 24 hr. It prevents the interior metal of the rail head from being torn apart in a certain range of temperature (around 600 deg.) where brittleness is greatest between the exterior and interior of the head. Extensive research work has shown that when this tearing or shattering is avoided, the possibility of the development of transverse fissures becomes remote.

"Normalizing" is another term you will hear much about. Briefly, this process involves the cooling of rails initially to 1,000 deg. F., by running them into a continuous furnace under close temperature control, and reheating them to 1,500 deg. F. in 30 min. From this point on the cooling of the rails is identical with present practice. The process is designed to cause grain refinement to eliminate rolling strains, and to reduce the tendency towards internal shattering. Both of these processes have the same primary purpose—the elimination of fissures. It should be clearly understood, however, that the effectiveness of these methods will be less marked in eradicating the common split and crushed heads, and will have little or no effect on web or bolt hole failures, or on moon-shaped base breaks.

Hardening Rail Ends

The hardening of rail ends at the mills is still another development that is coming rapidly to the front. While much of this has been done in the field, it is a new departure in mill operation. Various methods are used in different combinations, with the heating being done with producer gas or the electric arc and the quenching by air, water or oil. In some cases the hardening process is applied during the initial cooling of the rails; in others by heating the cold rail rapidly to 1,500 deg. with subsequent quenching, the medium for the latter step depending on the process. Air quenching is being used extensively.

Because of the importance of the subject, comprehensive studies of the structural and physical characteristics of rails are in progress at the University of Illinois. Included among these studies are rolling-load tests to determine the rate of batter. Rails with field-hardened ends are also being subjected to these tests so that the merits and comparative values of the various methods of hardening rail ends may be equated.

Need for Caution

Until the facts have been developed, a cautious attitude toward rail-end treatment should be taken. The heat treatment of high carbon steel is difficult, and wide structural changes may result from fairly small temperature differences. We should be reasonably sure that anticipated benefits from the reduced or slower rate of batter resulting from end hardening are not more than offset by structural and physical difficulties that may arise during the life of the rails in service. In any event, in view of the tendency to the segregation and collection of impurities, especially on the top end of the rail, as rolled, it seems questionable whether "A" rails should be subjected to the hardening process.

Another process now in commercial development, which looks promising, is the hot mitering of rail ends. The method is unique, first because it has never before been used on hot rails, but principally because only the upper half of the rail is mitered —that is through the head and down to the center of the web. The balance of the rail end is given the standard square cut. The square cut eliminates the possibility of the rail ends running by each other. The top mitered surfaces create, in effect, a continuous line of contact, instead of the gap that is presented by standard sawed rails. More may be heard of this process later.

Of course, many incidental improvements have been made in the manufacture of rails. Close control of these is striven for constantly, but in spite of this, and the taking of all possible precautions, variations in the quality of steel and in its hardness and physical characteristics are bound to occur. Specifications must of necessity recognize these features, and fairly wide limits are therefore permitted for the chemical elements, each of which has a definite function in imparting properties to steel.

In conclusion, preceding the present era, a definite and logical improvement was fortunately made in rail design to secure greater strength, carrying capacity and better distribution of the metal in the parts comprising the section. This improvement has extended to joint bars, to the application of heavier tie plates of better design and to various other accessories making up the track structure.

* Inspecting Engineer, New York Central, New York.

Getting the Most from Crossties

By John Foley*

Those responsible for maintenance of way expenditures cannot be expected to keep them at a minimum if they are not supplied with crossties suitable for the service expected of them. All that is necessary for the procurement of satisfactory ties for any service is adherence to well-known standards in their inspection.

Unfortunately, variations in the application of specifications have been so wide that the American Railway Engineering Association in 1926 deemed it necessary to urge all members "to make

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observations of their own ties. In the first place, they should insist that each tie be marked to show the size at which it was accepted. Then the membership will be able to see whether ties accepted and paid for as of a given size actually meet the standard requirements of that size. Interest in the character of ties delivered on the part of those responsible for their use would correct much of the fault in the procurement of ties. The oversizing of ties will cease whenever those receiving them question the marking of any which are too narrow or too thin for acceptance at the given size." Again in 1927, this committee urged "the user of ties to insist on the delivery of standard ties, in standard sizes, stamped so that the responsibility for the acceptance of them can be placed." While there has been a marked general improvement in inspection practice during the last 10 years, there are departures from good practice which warrant repetition of the above suggestions.

Up to the Railroads

The producer of ties will make only what the railroads will take. Therefore, the output of substandard ties is to a large extent under railroad control. So long as there is lack of uniformity in railroad inspection some manufacturers figure that it pays to produce ties acceptable by any railroad; others that it is better business to carry poorer ties and cater to the railroads that are not particular about adhering to specifications.

Procuring crossties of standard soundness and size does not in itself assure getting the most from them. Those that are not to be put in track as soon as received from the shipper must be given attention to insure that their condition when inspected and accepted will be maintained. Wood is subject to deterioration from natural causes in its raw state, and ties suffer most from splitting and decay. Uneven shrinkage of the wood causes splitting, which should be prevented from progressing to the point that renders a tie useless. Effective devices for reducing the number and extent of splits are available, and their application at the time, in the position and in sufficient quantity to prevent serious damage, will contribute toward getting the most from crossties.

Sound crossties which are stored on unsanitary sites are soon infected with decay, and those who have to hold untreated ties will not get the most from them if poor drainage, rank vegetation, insufficient air circulation or long storage, alone or in combination, start the deterioration of the crossties before they are put in track.

Protection Against Wear

The protection from wear under the rail which tie plates are designed to give the ties is most effective only when the bearing areas are in one plane. Machine adzing before the tie is installed insures the best results. Not only hewed ties but sawed ties also, should be made level and smooth, since the latter are not always sawed with parallel tops and bottoms, and even when they are they seldom stay so under the warping that takes place as they season. If the adzing of treated ties by hand or machine in the field exposes white wood, the painting of the adzed area with creosote is a contribution toward getting the most from crossties.

Plates with bottom ribs designed to anchor the plates to the ties by seating themselves under traffic do so at the expense of the wood fibers they break and crush. Machining a groove for these ribs reduces the destruction of the wood and thus aids in getting the most from crossties. Spikes are held tighter by the wood when driven into bored holes. Where the number of rail sections used is not so great as to make boring impractical, preholing for cut spikes lessens destruction to an extent which will help in getting the most from crossties.

Effectiveness of Treatment

By such preservative treatment as had been given ties during the last 30 years, decay has been eliminated to an extent which made it possible to reduce annual replacements from 100,000,000 to 40,000,000 ties. Statistically, the indicated trend is for an average annual replacement of 50,000,000 ties, a low rate of consumption that is possible only if ties are protected from decay until they are worn out.

The satisfactory seasoning of crossties to be given preservative treatment is possible only when storage yards are prepared for that purpose and when the ties are cared for in a manner to eliminate decay. Leaving ties in varying quantities at numerous places along the right-of-way where they may have been accepted results in the decay of many of them before they are treated.

Ties are heavy and unwieldy, and in consequence cannot be handled gently. They can stand much rough handling, but it is reckless to drop them upon rails or rocks from such heights that they will be broken.

Moving treated ties with pointed tools is a careless procedure. The puncture of a pick may penetrate through the treatment at a point where the wood resisted the diffusion of the preservative to the desired depth. Forcing ties into position when spacing and alining them by blows with a spike maul results in mashed, softened wood fibers which provide a focal point for decay to start.

The advantages of bored spike holes in crossties are lost if the driving is carelessly done; the spike must follow the vertical hole if there are not to be less fibers holding it than if the hole had not been made. The removal of loose spikes as promptly as practicable lessens the likelihood that the space around them will provide an entrance for decay. The filling of the holes with plugs driven to the bottom re-establishes effectiveness of the tie.

Careful Selection

The several standard sizes of crossties are designed to permit such selection as may suit the requirements in tracks of varying traffic densities. Using Size 1 where Size 5 is required is not getting the most from crossties.

The several standard groups of woods provide kinds having strength values which permit selection to meet different traffic conditions and types of track. Where both Group a and Group b ties are available in a railroad's stocks, the use of Group a ties in the tracks of heavier traffic and in curves is getting the most from crossties.

The pre-adzing of ties has greatly reduced the number inserted with their bottoms up. Pith shakes, which are common in broadleaved woods, generally develop into deep, extensive cracks when exposed to the weather, as they are when not turned underneath as a tie is placed in the ballast. These fissures may extend past the treated area, which is thinnest where the heartwood (in which the pith is located) is exposed on the defined bottom of the tie. Getting the most from crossties requires more care in placing the defined top of a tie up in track than has been taken in many quarters.

Factors that Determine When Rail Should Be Relaid

The considerations affecting the selection of rail for renewal have been greatly changed in recent years by the perfection of methods for the conservation of rail in track, primarily the building up of battered ends, according to the report of a committee of which C. W. Baldridge, assistant engineer, Atchison, Topeka & Santa Fe, was chairman. Under present conditions, according to the report, rail should not be renewed so long as its condition throughout its length is satisfactory. There has been a marked increase in the life of rails now approaching the renewal stage; a similar increase may be expected in the life of rails in the future. With this increase in life assured, there is little likelihood of a pronounced increase in the volume of renewals over a short period at any time in the immediate future.

Taking up the routine procedure of selecting rail for renewal, the committee endorsed the common practice of having the recommendations originate with the roadmaster but stated that "it is desirable to have the final recommendations made by some one who is equally responsible for renewals on all parts of the system." The main body of the report related to the procedure of the engineer maintenance of way, or the rail inspector who represents the management, in making the routine studies upon which rail budgets are predicated.

Following is a list of the factors to be considered:

FACTORS AFFECTING RENEWAL

A. (1) Safety of trains as affected by the condition of the rail.
(2) Riding quality of the track as affected by the condition of the rail.
(3) Cost of track maintenance as affected by the condition of the rail.
(4) Cost of renewal with new rail.

FACTORS AFFECTING REPAIRS

1. Cost of repairing the present rail and fastenings.
2. Cost to maintain the track after repairs are made.

operations following floods, and also enumerated the various types of snow melters that have been found effective in keeping switches, car retarders, etc., clear during blizzards.

Conclusions

In the foregoing discussion we have not attempted to present a study of the economical use of work equipment, the purpose being rather to show the unlimited possibilities of effecting economies in track maintenance through its use. Economies in track maintenance have been obtained with work equipment in the following ways:

1. Quality of work performed—the quality of work performed by work equipment equals and in many cases surpasses that done by hand methods.

2. Quantity of work done—A maximum amount of work is accomplished in a minimum length of time. Production in many cases has been doubled.

3. Flexibility in use of machines—Work that was formerly thought impossible in the field has become routine maintenance work. The life of rail, frogs and switches has been greatly increased.

4. Reduction in force—Less men are required to perform a greater quantity of work.

Discussion

That the value of work equipment as a means of reducing labor costs and improving the quality of the work done is generally recognized was emphasized by the discussion of this report. Those participating in the discussion were generally of the opinion that, in the interest of economy, each piece of work equipment should be adapted to a variety of tasks. Consideration was also given to the need for so equipping and organizing large maintenance gangs that each piece of equipment will be kept busy during the entire time that the gang is working.

Steam Railway Accident Statistics 1922—1935

WASHINGTON, D. C.

SINCE 1888, when regular accident statistics for steam railways were first compiled by the Interstate Commerce Commission, there have been numerous changes in the rules for reporting accidents. Only general comparisons can be made for the entire period, such as those given regularly in Appendix A of the annual I. C. C. accident bulletin. The Bureau of Statistics of the commission has issued a statement accompanied by several tabulations reviewing a larger number of selected items from the railway accident statistics over a period during which the requirements concerning the reporting of railway accidents have been unchanged. Generally, the years 1922 to 1935 have been covered.

Number of Train Accidents

Table No. 1 gives the number of collisions, derailments, and other train accidents without referring to the deaths and injuries connected therewith. These are covered by subsequent tables. A train accident is reportable if it causes damage to railway property of more than $150. The peak year for train accidents in this period, 1923, was a year of maximum locomotive mileage and followed the shopmen's strike of 1922. The number of train accidents per million locomotive and motor-train miles declined each year after 1923 to 1933, and the rate in 1935 was about one-half of that of 1922 but larger than that of the the two preceding years.

Casualties to Persons

Table No. 2 shows the number of fatal and nonfatal injuries reported for persons of all classes in the three groups of accidents, train, train-service, and nontrain. The more rapid decline in number of injuries than in number of fatalities is said to be the result of the use of these statistics in safety contests which give carriers an incentive to scrutinize carefully the reportability of each accident, it being their desire to report the smallest possible number. The decline in accident frequency on railways, according to the statement, is more accurately reflected in the decline in the number of persons killed. The reduction in fatalities from 7,233 in 1923 to 5,107 in 1935 is partly the result of improved safety conditions and partly of smaller employment and traffic.

Casualties to Passengers

Table No. 3 summarizes the accidents to passengers. In 1922, 185 passenger fatalities were reported. There was a decline to 24 in 1932 and to 26 in 1935. In collisions and derailments, 96 passengers were killed in 1922 and none in 1935. In 1932 there was only one. The number of passengers carried greatly declined in this period, but the passenger fatal accident rate per 100-million passenger-miles shows the striking reduction from .508 in 1922 to .112 in 1932 and .135 in 1935. Not included in the statistics of killed are deaths of injured persons occurring after 24 hours following the accident. In 1935, there were 7 such subsequent deaths of injured passengers.

Casualties to Employees on Duty

Table No. 4 reviews casualties to railway employees on duty. The deaths numbered 1,587 in 1922, 500 in 1933, and 555 in 1935. Per million man-hours, the fatality rate was 0.37 in 1922, 0.22 in 1931 and 0.24 in 1935. From 1922 to 1935, the employee fatalities in train accidents declined 69.6 per cent; in train-service accidents 63.7 per cent; and in nontrain accidents 65.4 per cent, or roughly in the same proportion.

The decline in the injury rate was relatively greater, but this decline exaggerates the actual reduction in accident frequency for the reason mentioned above in connection with Table No. 2.

Casualties to Nontrespassers (Other Than Employees on Duty and Passengers)

The casualties referred to in Table No. 5 occur chiefly at highway grade crossings. In 1935, in a total of 1,814 nontrespasser fatalities other than employees and passengers, 1,598 fell in the highway grade-crossing class. This total is obtained by combining 1,481 given in the body of the table with 117 given in the footnote.

Per million locomotive and motor-train miles, the fatality rate for these nontrespassers rose from 1.23 in 1922 to 1.58 in 1928. It fell to 1.36 in 1930 but has again risen to 1.51 in 1935.

Casualties to Trespassers

Table No. 6 refers to accidents to all classes of trespassers on railway property. The total number of fatalities was greater in 1935 than in 1922 and the fatality rate per million locomotive and motor-train miles increased from 1.44 in 1922 to 2.23 in 1935. The effect of safety education inaugurated by the railways

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(2) Riding quality of the track as affected by the condition of the rail.
(3) Cost of track maintenance as affected by the condition of the rail.
(4) Cost of renewal with new rail.

Factors Affecting Repairs

1. Cost of repairing the present rail and fastenings.
2. Cost to maintain the track after repairs are made.

3. Greater cost, if any, of inserting new ties and resurfacing after repairs rather than after renewals.
4. Net cost to repair and carry the old rail versus the net cost of renewal.

B. Capital:

1. Are funds available for immediate renewal?
2. Can greater improvement of the track as a whole be made with the funds available by using them for repair work or for renewals?
3. Will the advantage of postponing renewal until funds are most readily available be commensurate with the deterioration resulting from such postponement?
4. Will the postponement of renewals by making repairs cause an excessive volume of renewals in the future?

C. Relayer Rail Requirements:

1. How urgent are the requirements for renewal on tracks to be relaid with second hand rail?
2. Do such requirements justify anticipating the main line renewals?

D. Prospective Changes in Rail Sections To Be Used in Main Tracks:

1. If a change to a heavier section of rail is in prospect, will such change justify delaying renewals?
2. Will such a change in rail section produce savings which justify anticipating renewals as soon as the heavier section is available?

Condition of the Track:

1. Condition of the ties.
2. Condition of the ballast.
3. Surface of the track aside from the condition of the rail.
4. Drainage of the track.

General Inspection Studies

Factors Which Need To Be Studied To Determine the Condition of the Track:

1. Amount of traffic handled by the rail.
2. Density of traffic.
3. Alinement of the track (number, degree and length of curves).
4. Grade (controlling).
5. Speed of trains.
6. Condition of ties.
7. Kind of ballast.
8. When last surfaced out of face.
9. Kind and condition of rail joints.

To Determine Condition of Rail:

1. Contours of rail (not of much value).
2. Batter measurements at rail ends.
3. Per cent of rails which show wear spots.
4. Per cent of rails showing driver burns.
5. Per cent of rails having chipped ends.
6. Per cent of rails having sufficient batter to require repair by welding.
7. Per cent of rails damaged by broken wheels, kinked, bent, etc.
8. Number of failures throughout the service life of the rails, by years.
9. Kinds of failures.
10. Number of rails of known transverse fissure heats that are still in track.
11. Is bad riding condition due to the condition of the rail or inadequate track maintenance.
12. Number and condition of turnouts and crossings.
13. Percentage of rail ends which have been repaired by welding.
14. Corrosion and brine eaten condition of rails and fastenings.
15. Line and surface of track.

Repairs Versus Renewals:

For determining cost of repairs, check:

1. Number of joints in which rail ends need to be built up.
2. Number of joint bars needing renewal, reforming or shimming.
3. Bolts needing renewal or improvement by springs or washers.
4. Per cent of ties that will require replacement if rail is renewed.
5. Per cent of ties that will require replacement if rail is repaired.
6. Effect of rail repairs on resurfacing requirements—can resurfacing be postponed?
7. Annual saving in cost per mile of maintaining and operating the road by renewing rail.
8. Annual saving in cost per mile of maintaining and operating the road by repairing the rails.

Supplementing this list, the committee cited four factors that should be considered where financial conditions limit the rail renewals to an amount below what is actually needed from the standpoint of physical conditions.

1. The allotment of new rail among various locations (otherwise equal) in such a way that the released rail for main track repairs will be available for use at a minimum outlay for hauling and distributing.
2. The allotment of rail to localities of greatest risk to traffic from failures which might occur in the old rail if it were not replaced.
3. The allotment of rail to locations of greatest traffic density or of greatest wear.

Discussion

The discussion on the report had to do almost entirely with the damaging effect of wheel burns and wheel nicks on rails and the advisability of leaving rails so damaged in the track. The consensus was that sharply or deeply nicked rails, especially if the nicks are in the base, are a distinct hazard and should either be removed promptly from the track, or the weakened areas protected by the application of joint bars. Driver wheel burns were considered less dangerous than wheel nicks, although several members said that they considered it advisable to watch these defects carefully, especially if caused in snow drifts, and to remove rails so damaged if the burns are frequent and deep.

Report on Curve Lubricators

The lubrication of rails on curves was discussed in a report by a committee of which H. E. Kirby, assistant engineer, Chesapeake & Ohio, was chairman. This report is abstracted below.

The wear of rails, wheel flanges and locomotive tires resulting from the operation of trains over curved track has long been recognized as a source of waste of materials and labor. As the losses from operation over curved track became known to some extent, means were sought to reduce them. This led to the application of grease to the rails by hand. About 10 or 12 years ago development was begun on automatic devices attached to the rail, most of which, for mechanical facility of operation, were designed to use oil. However, certain factors were unfavorable to the successful use of oil, and to eliminate these objections these devices have been improved until at this time most rail lubricators are designed automatically to apply grease containing graphite or heavy asphaltic oil.

Thus, the development of lubricating machines brought about experimentation in lubricants, which showed that the heavy, asphalt-base oils give more lasting results than light oils, as the former have more body and adhere longer to rail and flanges. The greases used today are usually "hot-mixed" and contain from 12 to 18 per cent of fine graphite, mixed uniformly. With a lubricator applying grease in the proper manner, there is very little wastage from grease thrown off.

Economies Realized

There is much physical evidence of the extent to which the life of high rails on curves is increased by lubrication. Many railroads have taken cross-sections of the rails on particular curves to determine the relative wear before and after lubricating the rail, and in view of the information which has been received by the committee on the increased life of the high rails on curves that has been obtained by lubrication, it estimates that rail lubrication increases the life of such rail 100 per cent or more, depending on traffic conditions, loads on engine drivers, grades, the weight and section of rail and other factors. In fact, the figures indicate that the life of lubricated rail is from 2.5 to 19.4 times greater than when ungreased.

As rails wear by flange cutting it is necessary to renew them or to throw them in to gage, thus causing unavoidable damage to the ties. Hence, a further saving, arising from the increased

life of ties, may be expected as a result of lubricating the rail, although no definite figures are available at this time.

The potential saving resulting from a reduction in curve resistance produced by lubricating the outer rail on curves may later prove to be the most important single benefit derived from the practice, but up to this time apparently no tests have been made to determine this effect. Statements have been received from a few railroads, however, to the effect that the tonnage rating of trains has been increased following the installation of rail lubricators. In one case reported, that of a 10-deg. curve located at the top of a 1½-per cent ruling grade, the tonnage has been increased 15 to 20 per cent.

Definite savings are effected by increasing the life of car-wheel flanges and locomotive tires, but they cannot readily be determined from available records. This is especially true of car wheels, the life of which, if known, would be of limited value to this study because the movement of cars is not confined to a single railroad. There are three cases in point, however, with respect to locomotive drivers. Tests made by the Louisville & Nashville indicate a net saving of $300 per locomotive in a period of six months. The Southern found that on one division rail lubrication extended the average life of the front tires on freight engines two months (from 2½ months, ungreased, to 4½ months, greased), an increase of 30 per cent. For passenger engines the increase was 1½ months, or 75 per cent. On the Big Sandy subdivision of the Chesapeake & Ohio it is reported that prior to lubrication of the curves it was necessary to change the tires of locomotive drivers every two months, but that since lubrication of the curves was begun the tires run approximately twelve months before being changed.

The latest reports indicate that the average cost of lubricating rails may be near the figure given by the Southern, which is approximately $59 per year per mile of lubricated track. The annual cost of operating 247 lubricators on the Chesapeake & Ohio was $17,536.19, or $71 per lubricator per year. This figure includes the cost of the grease, of filling and cleaning the machines, and of the labor and materials applied in maintenance. Including annual investment and sinking fund charges, the figure becomes $29,703.36, or $120 per lubricator per year.

Discussion

Comments made from the floor following the presentation of this report disclosed that there is a widespread acceptance of the fact that, when properly designed and installed, rail lubricators contribute to increased life of rails and wheels and also to greater train tonnages. It was also revealed that lubricators are gaining wider use in terminals where they are producing excellent results.

The Use of Work Equipment

In a report presented by R. W. Grigg, supervisor, Pennsylvania, chairman of the Committee on the Use of Work Equipment, various types of equipment were discussed under topical headings designating the various major track maintenance operations in which they are employed. The information presented included a number of tables of cost data. However, in the opinion of the committee, economy in track maintenance involves more than merely the actual dollars saved on a particular operation. The quality of work must be considered; for example, a much better job is obtained by laying rail with work equipment.

The advantage from the standpoint of safety was also stressed in the report; for example, in discussing rail laying the committee called attention to the hazards involved, adding that with the use of cranes and other labor-saving devices the number of men required to perform the work has been greatly reduced and this has been followed by a proportionate reduction in accidents.

Following are excerpts from the Committee's comments on the performance of various operations with power equipment:

Cleaning Ballast

Hand cleaning of ballast is a slow and costly operation. With the introduction of ballast cleaning equipment, the number of miles of ballast cleaned has increased rapidly. The figures below are an average of those submitted by a number of larger roads on the cost of cleaning ballast.

Method	Cost per Lin. Foot	
Hand Shaking	$0.20	
Hand screens	0.13	
Locomotive crane (one with screen)	0.054	
Locomotive crane (multiples of three)	0.036	
Mole cleaning	0.052	intertrack
	0.045	shoulder
No. 1 Ballast Cleaner (rental basis)	0.0528	intertrack
	0.026	shoulder
No. 2 Ballast Cleaner (rental basis)	0.0534	

Through the use of ballast-cleaning equipment a greater number of feet of track can be cleaned each season, at a saving of more than 50 per cent compared with the cost of hand cleaning and a more satisfactory job is obtained.

Surfacing Track

Reports from several roads show that from 585 to 900 ft. of track can be tamped per day with pneumatic tampers. The costs ranged from 10 to 14 cents per foot of track tamped. From 350 to 600 ft. of track can be tamped per day with electric tampers, according to reports received from several roads. The cost of the electric tamping varied from 7 to 9 cents per foot.

Through the design of smaller and more flexible types of power units mechanical tamping is becoming more adaptable for spot surfacing. Savings corresponding to those effected through the use of mechanical tamping in out-of-face raising can be expected from the use of similar equipment in spot surfacing.

Unloading Ballast

The cost of unloading stone and gravel ballast has been reduced from 30 to 40 per cent through the use of special ballast cars. Unloading ballast necessitates either work-train or local-freight service, and the quicker the cars are unloaded the lower the cost. This is not the only factor involved, as the ballast has to be dressed by hand and a uniform distribution reduces the cost of dressing.

Drainage

Ditching is done with steam ditchers (both bucket and dipper), gasoline ditchers (both rail and crawler-mounted), the spreader, the gasoline drag-line and the bulldozer. The cost per cubic yard of ditching with such equipment has been reduced further through the use of special dump cars. Below is a tabulation of the cost per cubic yard of ditching with various types of machines, compared with hand ditching. These represent the range of costs submitted by four of the larger roads.

	Cost per Cubic Yard
Hand operations	$0.40 to $0.75
Steam ditcher	0.307
Gas ditcher operated with drop-end dump and ordinary dump cars	0.247
Front-end loading crawler-type excavator	0.25
Gas ditcher with drag-line	0.1042
Spreader	0.05 to 0.10*

* Equals about 2.67 cents per lineal foot.

Rail-End Repairs

One of the southwestern roads reports a cost of 72.6 cents per joint for reconditioning rail ends over a period of a year. An average of 40 joints were reconditioned per day per man. Another road reports that over a period of 10 years the cost of reclaiming joints by gas welding averages 10 cents per lineal inch. The arc welding of manganese crossings and frogs in track has resulted in a marked decrease in maintenance costs. This process has proved more flexible than the removal of frogs from track for repairs.

The life of rail has been increased through the use of surface grinders of both the wheel and reciprocating types. Cross grinders have also been perfected for grinding or slotting rail joints. The cost of this operation is given as 1.6 cents per joint. One road surface-ground its rail with a reciprocating grinder at a total cost of 9 cents per joint. Corrugated rail was also treated with this type of grinder, the corrugations being removed successfully. This work was done at a cost of 4.82 cents per foot of track, of 2.41 cents per foot of rail, using four grinders.

Supplementing its discussion of the primary uses of various types of work equipment, the committee called attention to the incidental application of various machines in such emergency work as snow fighting and salvage

operations following floods, and also enumerated the various types of snow melters that have been found effective in keeping switches, car retarders, etc., clear during blizzards.

Conclusions

In the foregoing discussion we have not attempted to present a study of the economical use of work equipment, the purpose being rather to show the unlimited possibilities of effecting economies in track maintenance through its use. Economies in track maintenance have been obtained with work equipment in the following ways:

1. Quality of work performed—the quality of work performed by work equipment equals and in many cases surpasses that done by hand methods.

2. Quantity of work done—A maximum amount of work is accomplished in a minimum length of time. Production in many cases has been doubled.

3. Flexibility in use of machines—Work that was formerly thought impossible in the field has become routine maintenance work. The life of rail, frogs and switches has been greatly increased.

4. Reduction in force—Less men are required to perform a greater quantity of work.

Discussion

That the value of work equipment as a means of reducing labor costs and improving the quality of the work done is generally recognized was emphasized by the discussion of this report. Those participating in the discussion were generally of the opinion that, in the interest of economy, each piece of work equipment should be adapted to a variety of tasks. Consideration was also given to the need for so equipping and organizing large maintenance gangs that each piece of equipment will be kept busy during the entire time that the gang is working.

Steam Railway Accident Statistics 1922—1935

WASHINGTON, D. C.

SINCE 1888, when regular accident statistics for steam railways were first compiled by the Interstate Commerce Commission, there have been numerous changes in the rules for reporting accidents. Only general comparisons can be made for the entire period, such as those given regularly in Appendix A of the annual I. C. C. accident bulletin. The Bureau of Statistics of the commission has issued a statement accompanied by several tabulations reviewing a larger number of selected items from the railway accident statistics over a period during which the requirements concerning the reporting of railway accidents have been unchanged. Generally, the years 1922 to 1935 have been covered.

Number of Train Accidents

Table No. 1 gives the number of collisions, derailments, and other train accidents without referring to the deaths and injuries connected therewith. These are covered by subsequent tables. A train accident is reportable if it causes damage to railway property of more than $150. The peak year for train accidents in this period, 1923, was a year of maximum locomotive mileage and followed the shopmen's strike of 1922. The number of train accidents per million locomotive and motor-train miles declined each year after 1923 to 1933, and the rate in 1935 was about one-half of that of 1922 but larger than that of the the two preceding years.

Casualties to Persons

Table No. 2 shows the number of fatal and nonfatal injuries reported for persons of all classes in the three groups of accidents, train, train-service, and nontrain. The more rapid decline in number of injuries than in number of fatalities is said to be the result of the use of these statistics in safety contests which give carriers an incentive to scrutinize carefully the reportability of each accident, it being their desire to report the smallest possible number. The decline in accident frequency on railways, according to the statement, is more accurately reflected in the decline in the number of persons killed. The reduction in fatalities from 7,233 in 1923 to 5,107 in 1935 is partly the result of improved safety conditions and partly of smaller employment and traffic.

Casualties to Passengers

Table No. 3 summarizes the accidents to passengers. In 1922, 185 passenger fatalities were reported. There was a decline to 24 in 1932 and to 26 in 1935. In collisions and derailments, 96 passengers were killed in 1922 and none in 1935. In 1932 there was only one. The number of passengers carried greatly declined in this period, but the passenger fatal accident rate per 100-million passenger-miles shows the striking reduction from .508 in 1922 to .112 in 1932 and .135 in 1935. Not included in the statistics of killed are deaths of injured persons occurring after 24 hours following the accident. In 1935, there were 7 such subsequent deaths of injured passengers.

Casualties to Employees on Duty

Table No. 4 reviews casualties to railway employees on duty. The deaths numbered 1,587 in 1922, 500 in 1933, and 555 in 1935. Per million man-hours, the fatality rate was 0.37 in 1922, 0.22 in 1931 and 0.24 in 1935. From 1922 to 1935, the employee fatalities in train accidents declined 69.6 per cent; in train-service accidents 63.7 per cent; and in nontrain accidents 65.4 per cent, or roughly in the same proportion.

The decline in the injury rate was relatively greater, but this decline exaggerates the actual reduction in accident frequency for the reason mentioned above in connection with Table No. 2.

Casualties to Nontrespassers (Other Than Employees on Duty and Passengers)

The casualties referred to in Table No. 5 occur chiefly at highway grade crossings. In 1935, in a total of 1,814 nontrespasser fatalities other than employees and passengers, 1,598 fell in the highway grade-crossing class. This total is obtained by combining 1,481 given in the body of the table with 117 given in the footnote.

Per million locomotive and motor-train miles, the fatality rate for these nontrespassers rose from 1.23 in 1922 to 1.58 in 1928. It fell to 1.36 in 1930 but has again risen to 1.51 in 1935.

Casualties to Trespassers

Table No. 6 refers to accidents to all classes of trespassers on railway property. The total number of fatalities was greater in 1935 than in 1922 and the fatality rate per million locomotive and motor-train miles increased from 1.44 in 1922 to 2.23 in 1935. The effect of safety education inaugurated by the railways

and protective measures adopted by railway police departments has been offset by the movement from place to place of larger numbers of persons in search of employment who cannot afford to travel in the regular way as passengers. While the highways of the country have attracted many persons of this class, the number of trespasser accidents on railway property has remained large.

Highway Grade-Crossing Accidents

Table No. 7 shows the increase in railway casualties at highway grade crossings from 1,969 killed in 1917 to 2,568 in 1928 and a subsequent decline to 1,680 in 1935. The ratio of injured to killed has increased somewhat during this period, this series not having been affected by safety contests.

The rapid substitution of automotive for other classes of vehicles is reflected in Table No. 8. In 1917 only 60.64 per cent of the highway grade-crossing accidents involved automobiles. The percentage increased to 90.78 in 1928 and has risen more slowly thereafter to 92.71 in 1935.

Table No. 9 brings the automobile accidents at crossings into comparison with the number of automobiles registered. The ratio of casualties to registrations has declined from 8.19 in 1917 to 2.24 in 1935.

Table No. 10. There is a considerable variation among the states in the trend of accidents at rail-highway crossings in the period 1922-1935. For example, the number of deaths in New York increased from 119 in 1922 to 209 in 1926 and decreased to 84 in 1935. In Ohio, there was an increase from 181 in 1922 to a peak in 1927 of 300, with a subsequent decline to 199 in 1935. For Illinois, the number in 1922 was 179; a peak of 288 was reached in 1928 and in 1935 the number was 225. In Kansas and Nebraska, it was greater in 1935 than in 1926.

Cost of Railway Accidents

There are no available figures which indicate the complete monetary loss resulting from accidents on steam railways. There are however, some statistics which have a bearing upon this question. In Table No. 11 are given figures taken from carriers' annual reports concerning the amounts charged to accounts for "Injuries to persons" and "Clearing wrecks" for the period 1911 to 1935. A peak was reached in both items in 1920. Thereafter, with few exceptions, the amounts declined year by year. Related to total railway operating expenses, these accident expenses have become relatively less important since 1914.

Monthly reports of railway accidents to the commission contain estimates of damage resulting from reportable train accidents. These are shown in Table No. 11(a) for the years 1923 to 1935 inclusive. Prior to 1923, the items were not given separately as to equipment, way and structures, and cost of clearing wrecks. There has been generally a decline in the total amount of such damage since 1923 with a slight upturn in 1935. In Table No. 11(a), the average cost per train accident is also given. The trend in this average is upward through 1933, followed by a drop in 1934 and a rise in 1935. The ratio of each of the three classes of damage to the total has fluctuated but little.

PASSENGER LOCOMOTIVE No. 12 of the Chicago, Rock Island & Pacific, which fell into the Cimarron river near Dover, Okla., on September 18, 1906, was found recently by swimmers near the bridge where it fell. The locomotive lies in about 14 feet of water. The accident in 1906 occurred when heavy rains caused the river to overflow its banks.

New Books...

Handbook of Engineering Fundamentals. Prepared by a staff of specialists under the editorship of Ovid W. Eshbach. Published by John Wiley & Sons, Inc., New York. 1,081 pages, 5½ in. by 8⅜ in., illustrated. Price, $5.

The "Eshbach" handbook is the first volume in a proposed new Wiley Engineering Handbook Series. It has been prepared for the purpose of embodying in a single volume those fundamental laws and theories of science which are basic to engineering practice and is essentially a summary of the principles of mathematics, physics and chemistry, the properties and uses of engineering materials, the mechanics of solids and fluids and the commonly used mathematical and physical tables, to which has been added a discussion of the elementary legal aspects of contractural relations with which all engineers should be familiar. The thirteen sections of the book cover Mathematical and Physical Tables; Mathematics; Physical Units and Standards; Theoretical Mechanics; Mechanics of Materials; Mechanics of Fluids; Engineering Thermodynamics; Electricity and Magnetism; Radiation and Light Acoustics, and Meteorology; Chemistry; Metallic Materials; Non-Metallic Materials, and Contracts.

Steam Locomotive Design: Data and Formulae. By E. A. Phillipson, Assoc. M. Inst. C. E., A. M. I. Mech. E., M. I. Loco. E. Published by the Locomotive Publishing Co., Ltd., 3, Amen Corner, E. C. 4, London, England. 420 pages, 5½ in. by 8½ in., illustrated. Price, $7.50.

The author has endeavored in this book to include only the essential theory of heat engines and application of mechanics, and to avoid repetition of the most elementary principles and abstruse academic theories which have but limited application to everyday practice. It is written in terms of British practice. Historical details and descriptive paragraphs are avoided, except where they affect present-day considerations of design. While the subject is treated largely from the viewpoint of the locomotive engineer, the book has been written to provide a reference on design for all those concerned with the construction, operation and maintenance of the steam locomotive and to meet the needs of the designer and the more advanced student for a textbook covering the subject in the light of recent research and current practice. There are twelve chapters dealing with factors which must be considered before the design of the locomotive is begun; tractive force, power, adhesion and resistance; determination of principal dimensions; boiler design; superheating and feedwater heating; compounding, etc. Numerous drawings of details, etc., are provided, and an Appendix presents ultimate tensile strength and other particulars of materials for locomotive construction as specified by the British Standards institution.

Proceedings of the American Wood-Preservers' Association for 1936. 582 pages, 6 in. by 9 in. Illustrated. Bound in cloth. Published by the association, 1427 Eye Street, N. W., Washington, D. C. Price, $6.

This volume contains the complete report of the thirty-second year's work of the association, and includes 36 papers and reports, in addition to the usual record of routine business. While some of the reports deal with technical matters relating particularly to the wood-preserving industry, 10 are of direct interest to railway men. These are Tie Service Records, Marine Piling Service Records, Post Service Records, Pole Service Records, Research on Termites in the United States, Electrical Resistance of Poles, Clean Treatments, a Bibliography Relating to Fireproofing of Wood, Experience of the Central of Georgia with Treated Materials, and what has come to be widely known as the Helphenstine report, presenting for 1935 data showing the quantities of wood treated and preservatives used in the United States, compiled by R. K. Helphenstine, Jr., of the Forest Service, Department of Agriculture.

In addition to the foregoing, many railway officers will also be interested in the papers on Creosotes—Their Toxicity, Permanence and Permanence of Toxicity, Toxicities of Creosotes and other Coal-Tar Products Extracted from Hardwood Ties Which Had Been in the Track for 20 Years or More, Creosote Treatment of Jack Pine, and the several committee reports dealing with the revision of the treatment standards for ties, timber and lumber, and poles.

NEWS

A.A.R. Approves Power Reverse Gear Agreement

Member roads at special meeting in Chicago ratify pact with the locomotive brotherhoods

An agreement reached between committees representing the carriers and the locomotive brotherhoods governing the installation of power reverse gears on locomotives was approved by member roads of the Association of American Railroads at a special meeting at the Blackstone hotel, Chicago, on September 25. Under the agreement all locomotives built after September 1, 1936, are to be equipped with power reverse gears, while all locomotives used in road service and weighing 150,000 lb. or over on drivers, and all switching locomotives weighing 130,000 lb. or over on drivers, are to be similarly equipped when they are placed in the shops for major repairs; this not later than January 1, 1942, unless the management and representatives of the employees on individual roads agree otherwise.

Negotiations on behalf of the railroads were conducted by Ralph Budd, president of the Chicago, Burlington & Quincy; M. W. Clement, president of the Pennsylvania; L. A. Downs, president of the Illinois Central; J. B. Hill, president of the Louisville & Nashville; F. W. Sargent, president of the Chicago & North Western; F. E. Williamson, president of the New York Central, and J. J. Pelley, president of the association.

The question of installing power reverse gears in locomotives has been under consideration for several years. On January 18, 1933, the Interstate Commerce Commission, after hearings, issued an order directing the railroads to equip their locomotives with power reverse gears before January 1, 1937. The order of the commission was entered on a complaint of the Brotherhood of Locomotive Engineers and the Brotherhood of Locomotive Firemen and Enginemen, which alleged that manually operated reverse gears are inherently unsafe and unsuitable in principle and design, subjecting the traveling public to unnecessary peril; and violating the boiler inspection act. In June, 1933, the American Railway Association and the American Short Line Railroad Association asked the federal district court for the Northern district of Ohio to set aside the commission's order, and on November 24 of that year the order was annulled by three federal judges in court at Cleveland. On January 7, 1935, the Supreme Court of the United States affirmed the decree of the lower court, basing its decision on the ground that the commission could make an order of the kind only in the interests of safety, and that there was an absence of any real finding that safe operation requires the discontinuance of the manual reverse gear and the substitution of the power reverse gear. Upon the request of the Brotherhood of Locomotive Engineers, the commission reopened the case on October 29, 1935, and briefs were filed in July, 1936. Since the commission has not rendered its decision, this agreement is expected to result in the dismissal of the proceedings.

The annual meeting of member roads of the association will be held at the Commodore Hotel, New York, on November 6.

Communications Commission to Investigate Telegraph Contract

Acting on complaint of the Postal Telegraph-Cable Company the Federal Communications Commission has ordered an investigation of provisions of the contract between the New York, New Haven & Hartford and the Western Union Telegraph Company. The general question of the legality of the Western Union's so-called exclusive contracts with railroads has been under consideration by the commission for some time.

New York to Washington in 215 Min.

The Congressional Limited, fastest of Pennsylvania trains between New York and Washington, D. C., has had 10 minutes more clipped from its schedule and the time now is 226 miles in 215 minutes, including six stops. The new time table includes also a new fast train, leaving Washington at 1:30 p.m., and running through to New York in four hours. The hourly trains between New York and Philadelphia (Broad Street Station) are all made faster, and the 8 a.m. from Philadelphia goes through in 94 minutes.

Mid-West Shippers' Board

The regular meeting of the Mid-West Shippers' Advisory Board will be held at Rockford, Ill., on October 8. Besides the reports of standing committees, the program will include an address by Ray Wantz, president of the Rockford Fibre Container Company. At a joint luncheon with the Rotary Club of Rockford, Elmer Serl will be the guest speaker, while George A. Blair will discuss the functions of the advisory board and W. Y. Wildman will present a resume of committee reports.

All Business Problems Now Akin to Railroad Problem

Dunn calls advocates of socialistic transport policies aids to wider application of such doctrines

"One of the important results of developments in this country within recent years, and especially since the New Deal began, has been to make the problems confronting other kinds of business remarkably similar to the problems with which the railroads have been confronted for 25 years," said Samuel O. Dunn, chairman of the Simmons-Boardman Publishing Company and editor of the *Railway Age*, in an address to the Wisconsin State Chamber of Commerce at Oshkosh, Wis., on September 24.

"For many years," Mr. Dunn continued, "business interests promoted the application of certain government policies to the railroads. They accepted the view that the railroads were a peculiar institution, because quasi-monopolistic and engaged in rendering a public service, and that therefore they should be subjected to regulation and government-subsidized competition.

"The railways have ceased to be even a quasi-monopoly because of the competition of government-aided carriers by air, highway and water. Meanwhile the New Deal has sponsored the policy of a 'planned economy,' the execution of which would involve government control of all kinds of business. This policy has been set back by decisions of the Supreme Court in the N.R.A. and other cases, but it has not by any means been abandoned. In addition the New Deal has engaged in government subsidized competition with numerous industries and threatens similar competition with others. The most conspicuous example is government competition with the power industry. But this is by no means the only one. Some of its principal proponents go so far as to advocate government subsidization of co-operatives that do, or would, compete even with retail merchants in all our cities and towns.

"Some fifty years ago the federal government began and has since been regulating railway rates to prevent discriminations. Now it has passed the Robinson-Patman bill to regulate prices of commodities to prevent alleged discriminations in them. The first federal legislation for collective bargaining and regulation of wages was applied to the railways. Now,

(*Continued on page 493*)

Express Agency Creates General Sales Department

President Head announces new plan of greatly widened sales promotion activities

Creation of a Railway Express Agency General Sales Department "to carry forward a greatly widened plan of sales promotion activities" was announced on October 1 by L. O. Head, president of R. E. A. The inauguration of this new department, which will maintain headquarters at the Express Agency's general offices, 230 Park avenue, New York, it is believed, makes R. E. A. "the first large transportation company to give definite recognition to modern selling principles as a factor in stimulating increased traffic."

The move follows through to capitalize on the "striking success" of the "More Business Plan" which was inaugurated by President Head throughout the Express Agency's nationwide organization late in 1932. Under this plan, the 50,000 employees of the company were assembled together in group meetings at regular intervals to discuss means of developing new business for express shipping and to reclaim former traffic that had gradually drifted to competing transportation mediums. Before this unified drive had been under way a year, the results began to become evident. In 1933, the upward trend in the volume of business handled by the Railway Express Agency started and it has progressively advanced each year since. In 1933, 118,000,000 shipments were handled, and the monthly increases during the first six months of this year have been even more pronounced.

Kinsey N. Merritt, former assistant general manager, Department of Public Relations, has been appointed to direct the General Sales Department with the title of general sales manager. In his new position Mr. Merritt will come in contact with drivers of vehicles for the Agency. "Curiously enough," Mr. Head said in this connection, "our drivers have borne the brunt of business solicitation. Of course, they are unusual drivers. Henceforth they and other employes will receive instruction in solicitation from a department organized for that purpose."

The creation of the new sales department is coincidental with executive changes resulting from the retirement of George S. Lee, vice-president in charge of traffic. In the latter connection Mr. Head made public the appointment of Calvin A. Frey as vice-president in charge of traffic, to succeed Mr. Lee, and in addition announced the creation of a new position, to be known as traffic executive, and the appointment to it of J. H. Butler, who has been general manager of the Department of Public Relations and who is well known to the shipping public throughout the country. Mr. Butler will keep closely in touch with all phases of express shipping, with the view to more closely cementing the relations between the patrons and the company, bringing about closer cooperation between the two.

Another important change in the traffic department involved the appointment of R. S. Wheeler, former traffic manager, as general traffic manager, also a new position. In his enlarged responsibilities Mr. Wheeler will have general direction of the company's traffic and rates. C. F. Messenkopf, assistant traffic manager, has been promoted to succeed Mr. Wheeler as traffic manager.

A. & W. P. Earned Net—A Correction

In the *Railway Age* of September 12, page 392, the net railway operating income of the Atlanta & West Point for the first seven months of the current year was incorrectly shown with a minus sign before it. The company had net railway operating income before depreciation and retirements of $36,353 instead of a net operating loss of that amount for this period.

New Haven Revives "Bicycle Trains"

The New York, New Haven & Hartford, which in the late spring operated four or five Sunday "bicycle trains" out of New York, the patronage of which in almost every case extended to the limit of the available cycles, has announced two additional excursions of the type for the autumn. One is to be run on October 4 and another on October 18.

Reduction in Refrigerator Car Mileage Found Not Justified

The Interstate Commerce Commission has issued a report finding not justified a proposal by the railroads to reduce from 1.7 to 1.5 cents per mile the allowance paid to car companies on refrigerator cars bearing the mechanical designation "RB," which are described as beverage, ice, water, or vinegar refrigerators, similar in design to bunker refrigerators except that they are not equipped with either ice-bunkers or ventilating devices. The reduction was proposed as part of a program recommended by a committee of the American Railway Association in 1933.

Atlantic Shippers' Board

The Atlantic Shippers' Advisory Board will hold its regular meeting at the Lord Baltimore Hotel, Baltimore, Md., on Thursday, October 8. In addition to the regular commodity reports, there will be discussions on: Simplification in publication of tariffs; legislative matters affecting the shippers and railroads; the consolidated freight classification; pick-up and delivery service; modification of demurrage rules; adequacy of freight cars; loss and damage (damage to furniture shipments; damage to neon signs).

W. C. Kendall will report for the A. A. R.; G. Metzman (New York Central) will speak for railroads in the local territory, and A. P. Stevens will speak on the freight car supply. At the noon-day luncheon, the principal speaker will be Fitzgerald Hall, president of the Nashville, Chattanooga & St. Louis.

The regular dinner and meeting of the Traffic Club of Baltimore is to be held in the Lord Baltimore Hotel, on Wednesday evening, to be followed by dancing. The Traffic Club has made arrangements to entertain the wives of Advisory Board delegates by a trip to Annapolis.

103 Railroads Report Net of $56,090,777 for August

Preliminary figure made public by A. A. R. compares with $36,833,008 for same month last year

Advance reports from 103 Class I railroads, representing 84.3 per cent of total operating revenues, just received and made public by the Association of American Railroads, show that those roads in August had a net railway operating income of $56,090,777 compared with $36,833,008 in the same month last year. Operating revenues of the 103 Class I railroads in August totaled $296,322,252 compared with $247,918,064, in August last year, or an increase of 19.5 per cent. Operating expenses of the same roads in August, this year, totaled $207,134,356 compared with $186,285,709 in August, last year, or an increase of 11.2 per cent. Taxes paid in August by the 103 railroads amounted to $24,285,340 compared with $17,362,068 in August, 1935, or an increase of 39.9 per cent.

Fifty-one Class I railroads, representing 93.3 per cent of the total revenues in the eastern district, advance reports show, had a net railway operating income in August of $33,299,348 compared with $21,744,140 in August, last year. Twenty-two Class I railroads, representing 89.3 per cent of the total revenues in the southern district, had a net railway operating income of $5,972,033 in August, compared with $3,029,964 in the same month one year ago, while 30 Class I railroads, representing 72.1 per cent of the total revenues in the western district, had a net railway operating income of $16,819,396 in August compared with $12,058,904 one year ago.

Operating revenues of the 51 railroads in the eastern district amounted to $161,120,941 in August, this year, compared with $132,883,430 in the same month one year ago, or an increase of 21.2 per cent. The 22 railroads in the southern district had operating revenues in August, this year, of $36,191,928 compared with $30,004,639 in August, last year, or an increase of 20.6 per cent, while the 30 railroads in the western district had operating revenues amounting to $99,009,383 in August compared with $85,029,995 in the same month one year ago, or an increase of 16.4 per cent.

Operating expenses in August of the same roads in the eastern district totaled $109,666,899 compared with $97,514,391 in August one year ago, or an increase of 12.5 per cent. In the southern district the roads from which reports have so far been received had operating expenses totaling $26,912,449 in August compared with $24,374,190 in August, last year, or an increase of 10.4 per cent, while the 30 roads in the western district which have reported showed operating expenses of $70,555,008 for August compared with $64,397,128 in the same month one year ago, or an increase of 9.6 per cent.

Glacier Park Visitors Set New Record

With a total of 205,782 visitors during the 1936 season, Glacier National Park

established a new attendance record for the fourth consecutive year. This year's record represents a 47 per cent increase over last year, when 140,256 persons visited the park. Travelers to the park by rail increased 30 per cent.

Club Meetings

The New England Railroad Club will hold its next meeting at Hotel Touraine, Boston, on Tuesday evening, October 13. The speaker will be Colonel J. T. Loree, vice-president and general manager of the Delaware & Hudson. As heretofore, at the Copley-Plaza, the meeting will be preceded by a dinner at the Touraine at 6:30.

The Chicago Car Foremen's Association will hold its annual meeting for 1936 on Friday evening, October 16, at the Hotel LaSalle, Chicago. New officers and directors will be elected for the ensuing year, after which the members, guests and their families will participate in an entertainment program and dance.

Canadian Union Condemns Naming of O. R. C. Man to C. N. R. Board

The grand council of the Canadian Brotherhood of Railway Employees last week at Ottawa brought its 27th annual meeting to a close by passing a resolution vigorously condemning the method employed in choosing Brenton L. Daly of Winnipeg as employees' representative on the Canadian National board of directors.

The grand division held choice of Mr. Daly, a railway conductor, had been made by undemocratic methods and largely by unions controlled in the United States.

Mr. Daly was appointed by the government by order-in-council September 16, after his name had been recommended by a conference of union general chairmen held in Montreal. The resolution held the representative should have been chosen by a vote of employees and said Prime Minister Mackenzie King had suggested previously the possibility of such a course.

Complaining Commuters Satisfied

The Pennsylvania announces that the six months' grievance of commuters in New Jersey, concerning an extra charge on monthly and weekly tickets when used to and from Pennsylvania station, New York City, has been settled to the satisfaction of all concerned. Beginning September 21, the supplemental fare of 15 cents was reduced materially and the chief complainant agreed to pay up for the rides in which he had refused compliance with the company's rules.

A supplemental ticket, valid within one month, at 10 cents a ride, is now to be sold with 60-trip monthly and 12-trip weekly tickets; the 10-cent rate being applicable at all stations as far as Cliffwood, N. J. (on the New York & Long Branch, 34 miles from New York). Beyond Cliffwood the price is graduated down to 7.5 cents a ride. Twenty-trip supplemental tickets, on the same basis, will be sold, usable within two months. Secondly, there is a 25-trip supplemental ticket at $2.50, valid within six months, to be used only in connection with 50-trip and 100-trip commutation tickets. The present supplemental tickets at 12.5 cents a ride, and the 15-cent tickets (with single trip tickets), will be continued.

Charles S. Okin, attorney in charge of the negotiations with the railroad company, has written a letter to the hundred—more or less—of commuters who have continued to refuse to comply with the rules and to whom the railroad company has sent bills for arrears, advising these persons that the railroad company is obliged by law to insist on payment of the legal tariff rates.

The reductions in rates apply not only on the Long Branch line but on the main line of the Pennsylvania as far as New Brunswick, 33 miles from New York.

Fourth Section Relief Allowed on Ocean-Rail Commodity Rates

The Interstate Commerce Commission has issued a fourth section relief order granting authority, on conditions, to continue or to establish and maintain commodity rates from and to eastern ports and interior points within New England and trunk line territories, on one hand, and points within central, Illinois and western trunk line territories, on the other hand, over ocean-rail and rail-ocean-rail routes through Baltimore, Md., Virginia ports, and Savannah, Ga., without observing the long-and-short-haul provisions of Section 4 of the interstate commerce act.

Net Deficit for Seven Months Reduced to $4,472,828

The net deficit of the Class I railroads, after deduction of fixed and contingent charges but before depreciation, for the first seven months of 1936 was only $4,472,828, according to the Interstate Commerce Commission's monthly compilation of se-

SELECTED INCOME AND BALANCE-SHEET ITEMS OF CLASS I STEAM RAILWAYS

Compiled from 138 Reports (Form IBS) Representing 144 Steam Railways

TOTALS FOR THE UNITED STATES (ALL REGIONS)

For the month of July 1936	For the month of July 1935	*Income Items*	For the seven months of 1936	For the seven months of 1935
$61,773,323	$26,919,344	1. Net railway operating income	$300,017,259	$221,695,798
12,550,950	12,336,382	2. Other income	84,065,146	90,762,026
74,324,273	39,255,726	3. Total income	384,082,405	312,457,824
1,542,346	1,426,240	4. Miscellaneous deductions from income	11,166,683	10,262,878
72,781,927	37,829,486	5. Income available for fixed charges	372,915,722	302,194,946
		6. Fixed charges:		
11,208,014	11,144,855	6-01. Rent for leased roads	78,260,640	77,738,977
41,061,074	41,427,651	6-02. Interest deductions	290,547,798	293,425,302
229,703	218,521	6-03. Other deductions	1,548,590	1,524,407
52,498,791	52,791,027	6-04. Total fixed charges	370,357,028	372,688,686
20,283,136	$ 14,961,541	7. Income after fixed charges	2,558,694	$ 70,493,740
999,831	999,832	8. Contingent charges	7,031,522	7,016,522
19,283,305	$ 15,961,373	9. Net income*	$ 4,472,828	$ 77,510,262
		10. Depreciation (Way and structures, and Equipment)	112,944,530	113,935,471
16,164,994	16,406,385	11. Federal income taxes	14,316,060	9,392,815
2,809,278	1,446,637	12. Dividend appropriations:		
3,039,329	2,313,329	12-01. On common stock	40,535,924	48,998,668
990,060	929,160	12-02. On preferred stock	14,192,971	9,056,062

Selected Asset Items	Balance at end of July 1936	Balance at end of July 1935
13. Investments in stocks, bonds, etc., other than those of affiliated companies (Total, Account 707)	$688,489,789	$740,014,651
14. Cash	$424,529,056	$347,677,031
15. Demand loans and deposits	6,842,362	13,028,088
16. Time drafts and deposits	32,451,437	29,579,556
17. Special deposits	131,938,836	51,764,784
18. Loans and bills receivable	2,505,757	4,094,553
19. Traffic and car-service balances receivable	61,509,109	54,235,968
20. Net balance receivable from agents and conductors	50,206,439	42,868,613
21. Miscellaneous accounts receivable	140,399,949	133,892,011
22. Materials and supplies	295,516,877	298,645,963
23. Interest and dividends receivable	26,500,323	31,423,597
24. Rents receivable	2,149,784	2,078,196
25. Other current assets	6,233,985	4,276,363
26. Total current assets (items 14 to 25)	$1,180,783,914	$1,013,564,723
Selected Liability Items		
27. Funded debt maturing within 6 months†	$177,720,045	$187,269,436
28. Loans and bills payable‡	$226,783,627	$344,448,695
29. Traffic and car-service balances payable	81,777,308	70,367,432
30. Audited accounts and wages payable	227,278,219	214,673,533
31. Miscellaneous accounts payable	92,532,299	58,019,311
32. Interest matured unpaid	478,310,702	357,147,952
33. Dividends matured unpaid	6,494,225	8,795,345
34. Funded debt matured unpaid	444,257,661	308,262,104
35. Unmatured dividends declared	9,345,821	7,849,917
36. Unmatured interest accrued	104,770,157	103,757,508
37. Unmatured rents accrued	26,962,947	26,128,931
38. Other current liabilities	25,040,824	15,452,784
39. Total current liabilities (items 28 to 38)	$1,723,553,790	$1,514,903,512
40. Tax liability (Account 771):		
40-01. U. S. Government taxes	$64,172,691	$32,457,926
40-02. Other than U. S. Government taxes	146,152,026	145,522,003

* The net income as reported includes charges of $1,510,745 for July, 1936, and $10,124,808 for the seven months of 1936 on account of accruals for excise taxes levied under the Social Security Act of 1935; also $3,846,268 for July, 1936, and $19,607,340 for the seven months of 1936 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes (Public No. 400, 74th Congress). The net income for July, 1935, includes credits of $932,436 and for the seven months of 1935 credits of $6,458,128, on account of reversal of charges previously made for liability under the Railroad Retirement Act of 1934.

† Includes payments which will become due on account of principal of long-term debt (other than that in Account 764, Funded debt matured unpaid) within six months after close of month of report.

‡ Includes obligations which mature not more than 2 years after date of issue.

§ Deficit or other reverse items.

NET INCOME OF LARGE STEAM RAILWAYS WITH ANNUAL OPERATING REVENUES ABOVE $25,000,000

Name of railway	Net income after deprec. For the seven months of 1936	Net income after deprec. For the seven months of 1935	Net income before deprec. For the seven months of 1936	Net income before deprec. For the seven months of 1935
Alton R. R.	* $959,458	*$1,732,558	* $759,148	*$1,547,872
Atchison, Topeka & Santa Fe Ry. System§	2,155,430	2,707,126	8,775,967	9,450,044
Atlantic Coast Line R. R.	1,423,266	* 623,963	2,665,419	688,070
Baltimore & Ohio R. R.	* 1,820,819	* 3,545,165	2,488,498	540,048
Boston & Maine R. R.	* 2,772,735	* 422,898	* 1,814,900	525,529
Central of Georgia Ry.†	* 1,472,609	* 1,682,874	* 1,023,395	* 1,207,149
Central R. R. of New Jersey	* 2,003,331	* 905,415	* 1,110,453	53,513
Chesapeake & Ohio Ry.	21,040,465	14,905,083	25,953,328	19,659,046
Chicago & Eastern Illinois Ry.‡	* 702,776	* 1,174,604	* 357,420	* 819,060
Chicago & North Western Ry.‡	* 9,788,534	* 8,610,668	* 6,871,916	* 5,671,167
Chicago, Burlington & Quincy R. R.	310,878	* 3,771,135	2,987,239	* 832,017
Chicago Great Western R. R.‡	* 496,849	* 1,132,328	* 206,788	* 828,941
Chicago, Milwaukee, St. Paul & Pacific R. R.‡	*10,212,153	*13,339,605	* 7,077,115	*10,065,895
Chicago, Rock Island & Pacific Ry.‡	* 9,398,690	* 9,745,348	* 6,890,534	* 7,165,243
Chicago, St. Paul, Minneapolis & Omaha Ry.	* 1,495,221	* 1,884,998	* 1,146,864	* 1,518,188
Delaware & Hudson R. R.	* 1,072,410	* 1,524,059	* 428,246	* 936,204
Delaware, Lackawanna & Western R. R.	* 653,484	* 1,880,192	904,817	* 304,434
Denver & Rio Grande Western R. R.‡	* 3,515,423	* 3,097,050	* 2,841,775	* 2,400,688
Elgin, Joliet & Eastern Ry.	867,863	829,486	1,392,703	1,347,349
Erie R. R. (including Chicago & Erie R. R.)	428,619	* 1,401,236	2,697,067	942,724
Grand Trunk Western R. R.	670,772	* 251,363	1,335,475	375,673
Great Northern Ry.	* 1,154,479	* 3,091,778	991,942	* 972,500
Illinois Central R. R.	* 2,073,642	* 3,137,396	1,754,153	780,905
Lehigh Valley R. R.	289,892	* 1,249,689	1,630,843	117,448
Long Island R. R.	* 455,592	* 775,861	223,730	* 78,746
Louisville & Nashville R. R.	4,040,434	1,619,675	6,479,464	4,112,232
Minneapolis, St. Paul & Sault Ste. Marie Ry.	* 3,658,892	* 3,959,809	* 2,945,227	* 3,307,869
Missouri-Kansas-Texas Lines	* 1,383,990	* 2,980,819	* 634,434	* 2,222,286
Missouri Pacific R. R.‡	* 6,771,709	*10,148,514	* 4,320,997	* 7,636,706
New York Central R. R.¶	1,410,557	* 5,810,803	10,853,716	3,899,072
New York, Chicago & St. Louis R. R.	1,383,822	* 274,704	2,285,315	675,621
New York, New Haven & Hartford R. R.‡	* 4,793,172	* 1,902,857	* 2,784,501	144,433
Norfolk & Western Ry.	16,838,819	11,695,717	19,463,933	14,323,284
Northern Pacific Ry.	* 5,472,200	* 7,430,466	* 3,626,475	* 5,568,960
Pennsylvania R. R.	15,768,215	11,296,105	28,448,264	23,907,274
Pere Marquette Ry.	1,257,105	220,173	2,737,115	1,721,235
Pittsburgh & Lake Erie R. R.	2,367,940	1,663,834	3,420,937	2,722,840
Reading Co.	3,407,392	2,657,375	5,266,333	4,420,429
St. Louis-San Francisco Ry.‡	* 4,957,793	* 7,167,754	* 3,076,486	* 5,325,021
St. Louis Southwestern Lines‡	* 272,177	* 394,868	81,409	* 31,348
Seaboard Air Line Ry.†	* 4,089,808	* 4,013,281	* 2,993,536	* 2,921,965
Southern Ry.	446,744	* 3,102,095	2,340,430	* 1,411,165
Southern Pacific Transportation System‖	1,320,977	* 2,999,791	5,910,425	1,437,815
Texas & Pacific Ry.	670,167	255,794	1,351,355	959,210
Union Pacific R. R.	4,339,295	3,866,423	8,099,547	7,632,172
Wabash Ry.†	* 1,525,559	* 1,916,154	* 280,619	* 652,224
Yazoo & Mississippi Valley R. R.	* 412,170	* 1,189,298	* 111,926	* 890,400

† Report of receiver or receivers.
‡ Report of trustee or trustees.
§ Includes Atchison, Topeka & Santa Fe Ry., Gulf, Colorado & Santa Fe Ry., and Panhandle & Santa Fe Ry.
¶ Includes Boston & Albany, lessor to New York Central R. R.
‖ Includes Southern Pacific Company and Texas & New Orleans R. R. The operation of all separately operated solely controlled affiliated companies resulted in a net deficit of $2,006,042 for seven months of 1936 and $2,290,039 for seven months of 1935. These figures are not reflected in this statement.
* Deficit.

lected income and balance-sheet items. For the corresponding period of last year there was a net deficit of $77,510,262. For the month of July there was a net income before depreciation of $19,283,305, as compared with a deficit of $15,961,373 in the corresponding month of 1935. For July 73 roads reported a net income and 62 a net deficit, and for the seven months period 59 reported a net income but 76 reported deficits.

General Foremen Elect Officers

Three subjects, or committee reports, were presented at the 30th annual meeting of the International Railway General Foremen's Association held September 15 and 16 at the Hotel Sherman, Chicago. The meetings were in charge of President A. H. Keys, district master car builder, Baltimore & Ohio, Pittsburgh, Pa., and the subjects considered were Maintenance of Diesel Locomotives, Production Methods in Locomotive Repairs and Maintenance of High-Speed Passenger Equipment.

At the close of the business session, the following officers were elected for the ensuing year: President, F. T. James, general foreman, Delaware, Lackawanna & Western, East Orange, N. J.; First Vice-President, F. B. Downey, general foreman, Chesapeake & Ohio, Huntington, W. Va.; Second Vice-President, J. Oxley, general car foreman, Chicago & North Western, Chicago; Third Vice-President, Charles C. Kirkhuff, general foreman, Atchison, Topeka & Santa Fe, Chicago; Secretary-Treasurer, William Hall, Winona, Minn.

Pacific Northwest Shippers' Board

The eleventh annual meeting of the Pacific Northwest Advisory Board was held at Spokane, Wash., on September 23, with an attendance of approximately 600 industrial, agricultural and railroad representatives from Washington, Idaho, Montana and Oregon. Reports of commodity committees indicate more optimism and greater confidence in improved business conditions than at any time within the last five years. These committees forecast that 212,137 cars will be loaded during the fourth quarter of this year, as compared with 187,902 cars in the same period of 1935, an increase of 12.9 per cent.

Carl R. Gray, president of the Union Pacific, the principal speaker, predicted that "we are going to see a greater movement of freight and passengers than in 1929, with fewer cars and yet more rapidly."

Officers elected for the ensuing year are: President, L. C. Newlands, vice-president and general manager of the Oregon Portland Cement Company, Portland; vice-president, W. G. Perrow, district manager of the Lehigh Portland Cement Company, Spokane, Wash.; executive secretary, R. R. Reter, vice-president and general manager of the Pinnacle Packing Company, Medford, Oregon.

Canadian Roads in August

In August operating revenues of the Canadian National totaled $15,733,625, an increase of $1,537,155 over the corresponding month of 1935. Operating expenses were $15,053,044, an increase of $1,426,246 over August last year. Net operating revenue for the month totaled $680,581, exceeding that of 1935 by $110,909.

For the current year up to August 31, operating revenues have totaled $116,491,348, an increase of $7,291,951. Operating expenses totaled $113,248,524, showing an increase of $7,892,458 over 1935. Net operating revenue of the system for the eight months totals $3,242,824, a decrease of $600,507 as compared with last year.

Net operating revenue of $634,484 was earned by the Canadian Pacific in August, which contrasts with $508,339 for August of last year, an increase of $126,144. Gross for August at $12,009,638 showed an increase of $1,073,062 over the gross for August of last year, while operating expenses at $11,375,153 showed an increase of $946,917.

For the first eight months, net operating revenues amounted to $8,404,584, as compared with $8,096,540 for the corresponding eight-month period of last year, an increase of $308,044. Gross for the eight months totaled $85,631,414, an increase of $7,036,646 over gross for the corresponding period of last year, while operating expenses at $77,226,830 showed an increase of $6,728,602.

Action on Certificates and Permits for Motor Carriers

The Interstate Commerce Commission recently has been making public almost daily reports proposed by examiners of its Bureau Of Motor Carriers or by joint boards created under the motor carrier act to whom have been referred applications by motor carriers for certificates to operate as common carriers or permits to operate as contract carriers. The proposed reports recommending the granting or denial of the applications and the recommended orders attached are to become effective after 20 days unless exceptions are filed or the order has been stayed or postponed by the commission. A large proportion of the applications has been opposed by railroads and other motor carriers.

Joint Board No. 28 has recommended denial of an application of the Missouri Pacific Transportation Company for a certificate for common carrier operation between Natchez, Miss., and New Orleans, La., on the ground that much of the territory is sparsely settled and that adequate bus and rail service is now available. The application was opposed by the Teche Greyhound Lines, Inc., the Yazoo & Mississippi Valley, and the brotherhoods of train service employees.

Joint Board No. 28 has recommended the granting of a certificate to the Gulf Trans-

port Company, controlled by the Gulf, Mobile & Northern, for operation as a common carrier of passengers between Tylertown, Miss., and Bogalusa, La.

Examiner D. C. Dillon, in a proposed report, has recommended the granting of a certificate to the Pennsylvania Truck Lines, Inc., affiliated with the Pennsylvania Railroad, authorizing the continuation of operations as a common carrier over routes which it has used since before June 1, 1935, and continuously since, and of a permit authorizing continuance of its operations as a contract carrier for the Pennsylvania and the Monongahela.

Labor Conditions in Domestic Water Transportation

Joseph B. Eastman, formerly federal co-ordinator of transportation, on September 30 made public a report on "Hours, Wages, and Working Conditions in Domestic Water Transportation," prepared by his Section of Research and the Section of Labor Relations as part of a comprehensive study of labor relations and conditions in the various branches of transportation. This is one of the several reports not completed when the co-ordinator's office expired by statutory limitation on June 16 but which are being completed with funds contributed by the railroads. Comparisons of labor standards in this branch of transportation with those found in other fields of domestic transportation are to be presented in a shortly forthcoming summary report. A chapter of conclusions by Charles S. Morgan, director of the Section of Research, and Otto S. Beyer, director of the Section of Labor Relations, says the time appears to be ripe to give very serious consideration to the setting up of machinery with national jurisdiction to exercise a continuing influence in developing a permanent and constructive policy for the water transportation industry.

New Cars for the "Hiawatha"

New cars, lighter in weight and embodying several unique changes in design, have just been completed in the Milwaukee shops of the Chicago, Milwaukee, St. Paul & Pacific and will replace present equipment of the "Hiawatha" on or about October 11. The 16 cars now comprising the Hiawatha will be used elsewhere. Prior to being placed in service, the cars will be exhibited at Chicago on October 5 and 6, at Milwaukee, Wis., on October 7; Portage, New Lisbon, and La Crosse, Wis., and Winona and Red Wing, Minn., on October 8 and St. Paul on October 10.

The new dining cars will have a seating capacity of 48, the largest single unit dining cars in service on any railroad. They will be located in the middle of the train instead of at the head end, and instead of in combination with a tap room as at present.

There will be three parlor cars on each train, instead of two as at present. Day coaches will have a greater seating capacity and more space for storing luggage. Tap cars located ahead of the coaches will be used entirely for buffet service. Air conditioning machinery, batteries and water tanks will be enclosed in a steel shell suspended from the center sill under the car. With this arrangement, air resistance will be reduced and the center of gravity of the car will be lowered. To reduce air resistance underneath the cars still further, folding steps have been constructed at each vestibule. Lighting, ventilation, air conditioning and deadening of sound have been given special attention.

Certificate Granted to Inland Navigation Company

Over the protests of the railroads the Interstate Commerce Commission, Division 4, has issued a certificate to the Inland Navigation Company covering operation by it as a common carrier upon the Willamette and Columbia rivers between Portland, Ore., and The Dalles, subject to conditions that it shall actually engage in such operation not later than February 15, 1937, and that by that date it shall provide or obtain the use of terminal facilities at The Dalles. The commission also ordered the Union Pacific, the City of Prineville Railway, and the Condon, Kinzua & Southern to join with the navigation company in establishing on or before May 1, 1937, via The Dalles as a port of interchange, through routes and joint rates for the transportation of grain and grain products and petroleum and petroleum products. The through rates are to be constructed by deducting from the lowest all-rail rate a differential of 1 cent per hundred pounds on grain and grain products and 2 cents per hundred pounds on petroleum and products. It is also provided that no joint rate need be lower than the corresponding all-rail rate between the point of origin or destination and the port of interchange.

P. R. R. Operates "Off Beaten Track" Excursion from New York

The Pennsylvania operated its first "off the beaten track" excursion from New York on Sunday, September 26. Proceeding over the company's main line to Morrisville, Pa. (across the Delaware from Trenton, N. J.), the train traversed the freight cut-off, which avoids Philadelphia, joining the main line again near Downingtown. From Downingtown the train traversed the little-used New Holland freight branch line to Lancaster; thence over another branch line to Columbia; and from there on the Port Deposit branch along the Susquehanna river (passing three large hydro-electric dams) to Perryville, Md., and thereafter on the main line back to New York. The distance traversed was approximately 375 miles and the fare $3.75. Upwards of 200 passengers took the trip. Three similar excursions have been operated from Philadelphia the first having about 200 passengers, the second over 500 and the third over 600.

The objective of these excursions has been precisely what the name indicates—to take the patrons to points of interest not easily reached by ordinary transportation, whether by highway or by rail. The itineraries have not been set up to appeal primarily to railroad "fans," but rather to the general public; and the character of the patronage attracted has been a fair cross section of the public. "Fan" interest is, of course, stimulated to the extent that, with frequent stops, and operation over little-used lines, the passengers get better opportunity to see railroad operations in a detail not usually visible to the traveler.

The company has a passenger representative in each car who is fully posted on the attractions of the country traversed, and who makes it his business to get acquainted personally with each passenger in his car. The result is a friendly camaraderie among passengers, putting them at their ease and in most cases quite obviously making them firm friends of the railroad.

Pennsylvania Electric Motive Power

At a round table discussion with delegates to the World Power Conference, held at Chicago, September 3, 1936, J. V. B. Duer, chief electrical engineer, Pennsylvania Railroad, was asked to discuss electric locomotives. He confined his remarks to a general discussion of electric locomotives used on the Pennsylvania, and spoke as follows:

"In 1928 when the management of the Pennsylvania Railroad decided to electrify its lines between New York and Washington, plans were laid to build two locomotives of the 4-6-4 type, which, when completed, were placed in service handling special trains between Trenton and Paoli and Trenton and Wilmington. After they had operated several thousand miles, the results were analyzed and decision was

A Stop to Inspect the Dam at Conowingo, Md.

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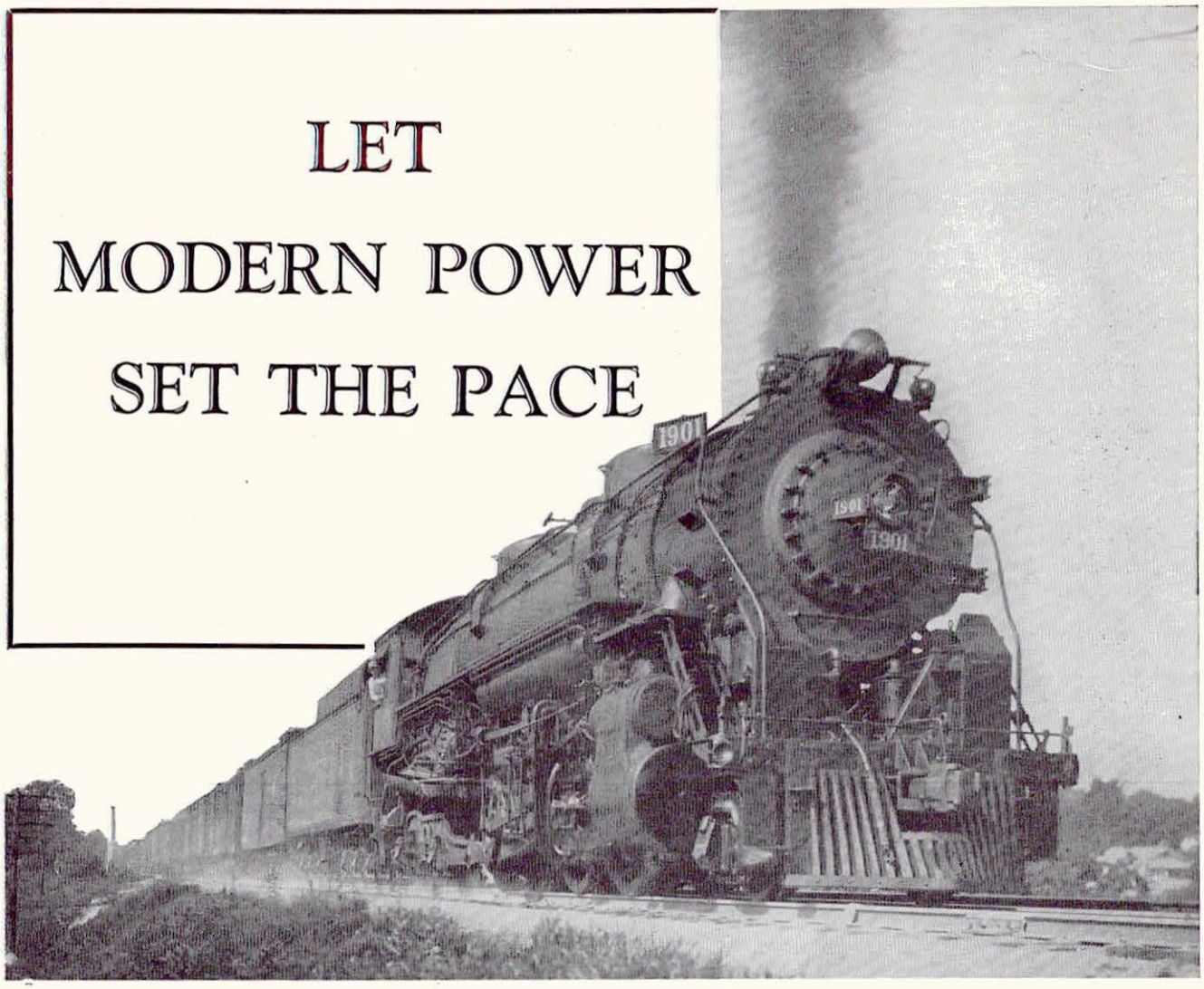
LET MODERN POWER SET THE PACE



Modern Locomotives move more tons faster—they save time. They bring more tons to the end of the run quicker and with smoother operation. They cause less interference with other units that are moving. They accelerate traffic, and in the quickening of movement, they improve operating standards and make increased use of every operating factor.

Such power does not increase present driving wheel load and is far less expensive to maintain.

LIMA LOCOMOTIVE WORKS INCORPORATED

LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

reached to build 62 additional locomotives of this type for handling the passenger service between New York and Philadelphia. These additional locomotives were placed in service in 1933 and during that year accumulated approximately 4,500,000 locomotive miles.

"Late in 1933 it was decided to proceed with the program of electrification between Wilmington and Washington and to review the experience with these electric locomotives and decide on the type of the additional locomotives to be built.

"Two additional experimental passenger locomotives were built and tested and as a result the GG-1 locomotive, now used on our through passenger trains, was selected.

"It is of the 4-6-6-4 type, develops approximately 4600 hp. continuously and 7000 hp. for short periods of time and can handle a 1400-ton train between New York and Washington at maximum speeds of 90 miles an hour. Fifty-eight of these locomotives are in service and are giving exceptionally good results, the commutator life and brush life of the motors greatly exceeding expectations.

"The locomotives of the P5 type, originally in the New York-Philadelphia service, have been transferred to the freight service between New York and Washington and 28 additional P5 locomotives with the streamline cabs are being used to handle the lighter passenger trains between New York, Philadelphia and Washington, where their capacity is adequate."

In response to a question, he also stated that "the selection of the single phase system by the Pennsylvania Railroad for its electrification between New York and Washington was the result of long experiment, development work, and tests with this system and the result of its use in this territory of dense traffic has fully justified its selection."

All Business Problems Now Akin to Railroad Problems

(Continued from page 488)

by the National Labor Relations Act, the federal government has applied similar legislation to other industries.

"Many business men, for their own purposes, still regard the railways as an industry that should be peculiarly subject to regulation and government-subsidized competition. The present federal administration and those responsible for its policies do not agree with them; and Old Dealers who continue to advocate socialistic policies for transportation are simply furnishing New Dealers with arguments for the application of socialistic policies to other kinds of business.

"Most business men do not like the application to their businesses of government policies of regimentation, subsidized competition, regulation of prices and compulsory collective bargaining. The railways have not liked some of these policies as they have been applied to them, either. The original theory was that such policies were necessary to protect the public from the railroads. The present theory is that they are necessary to protect the public from all business—little business as well as big business.

"The application and attempted application of similar government policies to all kinds of business makes it no longer possible to consider the railroad problem as a peculiar and distinct one. We are confronted now with one single great question affecting all business. This is, whether the people of the United States are going to turn 'right' or 'left.' If they turn 'right' there will be less government interference and competition with all business and more free private enterprise. If they turn 'left' there will be more government interference and competition with all business and less free private enterprise. Let business men not deceive themselves. They cannot eat their cake and keep it. They can no longer successfully advocate certain kinds of government policies for other people's business and entirely different policies for their own business. Our only choice in future will be between socialistic policies and non-socialistic policies for all kinds of business. This is the choice that is having to be made by the people of every civilized country. It is now being made in this country, and it will have to continue to be made over and over again in this country. Business men who do not see this are blind to present tendencies and issues in every civilized country in the world.

"How about the railways now? They are 'coming back' along with other business. If other business continues to come back, they will continue to come back. Their net operating income increased about 40 per cent during the last year in spite of new burdens of taxation and of other kinds, and their buying of equipment and materials from the manufacturing industry has increased more than correspondingly. If their net earnings continue to increase they will continue to make improvements in their properties and service, to increase their own employment and, by their buying from them, to increase employment in other industries.

"As goes the country so will go the railroads. Likewise, as go the railroads so will go the country. If policies are followed that hinder increase in their traffic and increase their expenses and taxes, the effects upon them will be the same as the effects of similar policies on other kinds of business. If they are not allowed adequately to increase their net earnings the ultimate result will be government ownership. If they go into government ownership its adoption will be accompanied or followed by similar socialization of a large part, or all, of the other business of the country.

"Our choice is not merely between radicalism, on the one hand, and bourbonism, on the other hand. We may take the middle course of liberalism. A liberal formerly was one who believed in private property and private enterprise—in regulation of naturally monopolistic and public service industries and in competition within naturally competitive industries. In view of the changes that have occurred, it is difficult to say now whether transportation should be a regulated or a competitive industry. But plainly all parts of it should be dealt with alike—all or none regulated and all or none subsidized. A liberal formerly believed that government should be restricted to its ordinary and necessary functions and should spend only as much as was necessary efficiently to perform those functions.

"This was formerly the 'American system.' I have always believed in it. I am old-fashioned enough to believe in it still—to believe that it is to the interest of every class of the people to return to it and especially to the interest of farmers and working men. It is the system which provided them with larger incomes in this country than they ever received under any other system or in any other country. It is the duty of business men to take the leadership in restoring the true American system and in convincing all classes that it is to their interest to restore it."

Meetings & Conventions

The following list gives names of secretaries, date of next or regular meetings, and places of meetings:

AIR BRAKE ASSOCIATION.—T. L. Burton, Room 3400, Empire State Bldg., New York, N. Y.

ALLIED RAILWAY SUPPLY ASSOCIATION.—F. W. Venton, Crane Company, 836 S. Michigan Ave., Chicago, Ill. To meet with Air Brake Association, Car Department Officers' Association, International Railway Master Blacksmiths' Association, International Railway General foremen's Association and the Master Boiler Makers' Association.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—W. R. Curtis, F. T. R., M. & O. R. R., Chicago, Ill.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 816 McCormick Bldg., Chicago, Ill. Annual meeting, October 27-29, 1936, Jung Hotel, New Orleans, La.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York, N. Y. Annual meeting, November 12-13, 1936, Roosevelt Hotel, New Orleans, La.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—F. O. Whiteman, Union Station, St. Louis, Mo. Annual meeting, June 15-17, 1937, Chicago, Ill.

AMERICAN ASSOCIATION OF RAILWAY ADVERTISING AGENTS.—E. A. Abbott, Poole Bros., Inc., 85 W. Harrison St., Chicago, Ill. Special meeting, October 9-10, 1936, Detroit, Mich. Annual meeting, January 15-16, 1937.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Borger, C. I. & L. Ry., 836 S. Federal St., Chicago, Ill. Annual meeting, October 5-8, 1936, Royal York Hotel, Toronto, Ontario.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, 319 N. Waller Ave., Chicago, Ill. Annual meeting, October 20-22, 1936, Hotel Stevens, Chicago, Ill. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY CAR INSTITUTE.—W. C. Tabbert, 19 Rector St., New York, N. Y.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—R. G. Buford, Asst. Mgr., Industrial Development Dept., M-K-T R. R., Dallas, Tex. Next meeting, October 8-9, 1936, Dearborn Inn, Dearborn, Mich.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in co-operation with the Association of American Railroads, Division IV.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 16-18, 1937, Palmer House, Chicago, Ill.

AMERICAN RAILWAY MAGAZINE EDITORS' ASSOCIATION.—J. L. James (Acting Secretary), Louisville & Nashville R. R., Louisville, Ky. Meeting, October 9-10, 1936, Detroit, Mich.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C., M., St. P. & P. R. R., 11402 Calumet Ave., Chicago, Ill.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—R. E. Schindler, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—C. E. Davies, 29 West 39th St., New York, N. Y.

Railroad Division.—Marion B. Richardson, 192 E. Cedar St., Livingston, N. J.

AMERICAN TRANSIT ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York, N. Y.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1427 Eye St., N. W., Washington, D. C. Annual meeting, January 26-28, 1937, New Orleans, La.

ASSOCIATION OF AMERICAN RAILROADS.—H. J. Forster, Transportation Bldg., Washington, D. C.

Operations and Maintenance Department.—

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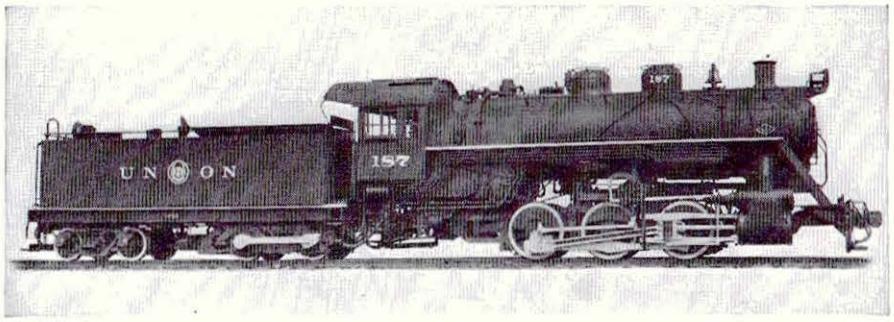


FRANKLIN REVERSIBLE BOOSTER

increases locomotive output by quicker starting of heavier trains

Among the recent power purchased by the Union Railway are the six-wheel switchers delivered early in June by the Lima Locomotive Works, Incorporated.

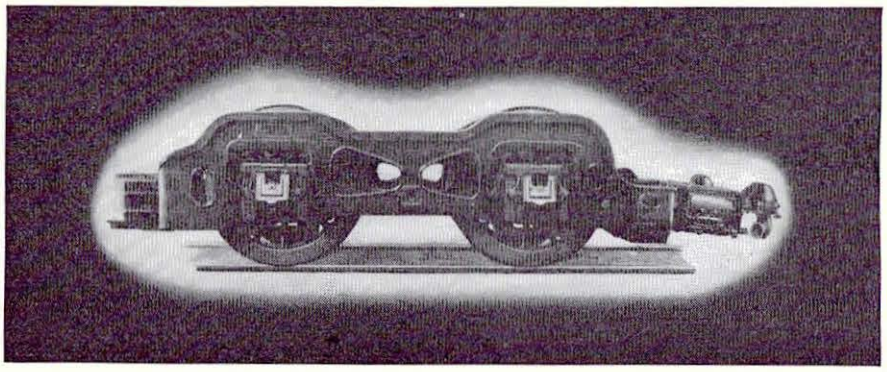
These locomotives, like others purchased by this road during 1936, are equipped with the Franklin Reversible Booster.

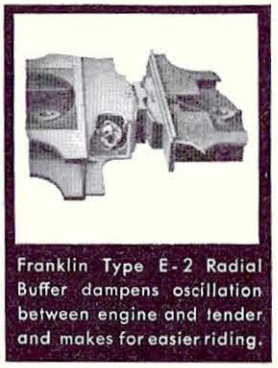
This power has a tractive force of 64,190 pounds in starting, of which 14,500 are added by the Booster.

The additional starting power in either direction which the Reversible Booster provides, permits the handling of heavier trains and speeds up train movements.

In transfer or hump yard service, or wherever frequent stops and reversals of direction are involved, the Reversible Booster not only enables the handling of heavier trains but cuts down the handling time by quicker starting.

It is equally applicable to either trailer or tender wheels of any locomotive.





Franklin Type E-2 Radial Buffer dampens oscillation between engine and tender and makes for easier riding.

Booster Repair Parts made by the jigs and fixtures that produced the original are your best guarantee of satisfactory performance.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

J. M. Symes, Vice-President, Transportation Bldg., Washington, D. C.
Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York, N. Y.
Freight Station Section.—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.
Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.
Protective Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.
Safety Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.
Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York, N. Y. Next meeting, October 6-8, 1936, Mayflower Hotel, Washington, D. C.
Division II.—Transportation.—L. R. Knott, 59 E. Van Buren St., Chicago, Ill.
Division IV.—Engineering.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 16-18, 1937, Palmer House, Chicago, Ill.
Construction and Maintenance Section.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill. Anual meeting, March 16-18, 1937, Palmer House, Chicago, Ill.
Electrical Section.—E. H. Fritch, 59 E. Van Buren St., Chicago, Ill. Annual meeting, October 27-28, 1936, Hotel Sherman, Chicago, Ill.
Signal Section—R. H. C. Balliet, 30 Vesey St., New York, N. Y. Annual meeting, March 15-16, 1937, Hotel Stevens, Chicago, Ill.
Division V.—Mechanical.—V. R. Hawthorne, 59 E. Van Buren St., Chicago, Ill.
Division VI.—Purchases and Stores.—W. J. Farrell, 30 Vesey St., New York, N. Y.
Division VII.—Freight Claims.—Lewis Pilcher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, 1937, Toronto, Ontario, Canada.
Division VIII.—Motor Transport.—George M. Campbell, Transportation Bldg., Washington, D. C.
Car-Service Division.—C. A. Buch, Transportation Bldg., Washington, D. C.
Traffic Department.—A. F. Cleveland. Vice-President, Transportation Bldg., Washington, D. C.
Finance, Accounting, Taxation and Valuation Department.—E. H. Bunnell, Vice-President, Transportation Bldg., Washington, D. C.
Accounting Division.—E. R. Ford, Transportation Bldg., Washington, D. C.
Treasury Division.—E. R. Ford, Transportation Bldg., Washington, D. C.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—F. L. Johnson, Chief Clerk and Claim Agent, General Claims Dept., Alton R. R., 340 W. Harrison St., Chicago, Ill. Annual meeting, May, 1937, Cincinnati, Ohio.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., 1519 Daily News Bldg., 400 W. Madison St., Chicago, Ill. Annual meeting, October 27-29, 1936, Hotel Sherman, Chicago, Ill. Exhibit by Railway Electrical Supply Manufacturers' Association.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—W. S. Carlisle, National Lead Company, 900 W. 18th St., Chicago, Ill. Meets with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 2271 Wilson Ave., N. D. G., Montreal, Que. Regular meetings, second Monday of each month, except June, July and August, Windsor Hotel, Montreal, Que.

CAR DEPARTMENT OFFICERS' ASSOCIATION.—A. S. Sternberg, M. C. B. Belt Ry. of Chicago, 7926 S. Morgan St., Chicago, Ill.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, 2514 W. 55th St., Chicago, Ill. Regular meetings, second Monday of each month, except June, July and August, La Salle Hotel, Chicago, Ill.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—E. G. Bishop, Illinois Central System, East St. Louis, Ill. Regular meetings, third Tuesday of each month except June, July and August, Hotel Statler, of St. Louis, Mo.

CENTRAL RAILWAY CLUB OF BUFFALO.—Mrs. M. D. Reed, 1817 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, second Thursday of each month except June, July and August, Hotel Statler, Buffalo, N. Y.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—(See Railway Fuel and Traveling Engineers' Association.)

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha St., Winona, Minn.

INTERNATIONAL RAILWAY MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich.

MASTER BOILER MAKERS' ASSOCIATION.—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—Clyde S. Bailey, 810 18th St., N. W., Washington, D. C. Annual meeting, November 10-13, 1936, Marlborough-Blenheim Hotel, Atlantic City, N. J.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. H. White (Pres. and Sec'y), Room 1826, 208 S. La Salle St., Chicago, Ill. Exhibit at A. R. E. A. Convention, March 16-18, 1937, The Coliseum, Chicago, Ill.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, second Tuesday of each month, except June, July, August and September, Hotel Touraine, Boston, Mass.

NEW YORK RAILROAD CLUB.—D. W. Pye, 30 Church St., New York, N. Y. Regular meetings, third Friday of each month, except June, July and August, 29 W. 39th St., New York, N. Y.

PACIFIC RAILWAY CLUB.—William S. Wollner, P. O. Box 3275, San Francisco, Cal. Regular meetings, second Thursday of each month, alternately at San Francisco and Oakland, excepting June at Los Angeles and October at Sacramento.

RAILWAY BUSINESS ASSOCIATION.—P. H. Middleton (Treas. and Asst. Sec'y), First National Bank Bldg., Chicago, Ill. Annual meeting November 5, 1936, Hotel Commodore, New York, N. Y.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 1941 Oliver Bldg., Pittsburgh, Pa. Regular meetings, fourth Thursday of each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. McC. Price, Allen-Bradley Company, 600 W. Jackson Blvd., Chicago, Ill. Meets with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—P. A. Bissell, 40 Broad St., Boston, Mass. Annual meeting, October 20-21, 1936, Congress Hotel, Chicago, Ill.

RAILWAY FUEL AND TRAVELING ENGINEERS' ASSOCIATION.—T. Duff Smith, 1660 Old Colony Bldg., Chicago, Ill.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1941 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division, Purchases and Stores Division, and Motor Transport Division, Association of American Railroads.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with Telegraph and Telephone Section of A. A. R., Division I.

RAILWAY TIE ASSOCIATION.—Roy M. Edmonds, 1438 Syndicate Trust Bldg., St. Louis, Mo.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Annual meeting, 1937, Chicago, Ill.

SIGNAL APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with A. A. R., Signal Section.

SOCIETY OF OFFICERS, UNITED ASSOCIATIONS OF RAILROAD VETERANS.—M. W. Jones, Baltimore & Ohio. Mt. Royal Station, Baltimore, Md.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, 4 Hunter St., S. E., Atlanta, Ga. Regular meetings, third Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta, Ga.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & C. R. R., Atlanta, Ga.

TOOL FOREMEN SUPPLIERS' ASSOCIATION.—E. E. Caswell, Union Twist Drill Co., 11 S. Clinton St., Chicago, Ill. Meets with American Railway Tool Foremen's Association.

TORONTO RAILWAY CLUB.—R. H. Burgess, P. O. Box 8, Terminal "A," Toronto, Ont. Regular meetings, fourth Monday of each month, except June, July and August, Royal York Hotel, Toronto, Ont.

TRACK SUPPLY ASSOCIATION.—D. J. Higgins, Gardner-Denver Company, 332 S. Michigan Ave., Chicago, Ill. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—(See Railway Fuel and Traveling Engineers' Association.)

WESTERN RAILWAY CLUB.—C. L. Emerson, C. M., St. P. & P., Chicago, Ill. Regular meetings third Monday of each month, except June, July, August and September, Hotel Sherman, Chicago, Ill.

Construction

CANADIAN NATIONAL.—Surveys for the new branch line of this company which will serve the mining district in Northern Quebec, south of the National Transcontinental, have been completed, and it is anticipated that construction work will be commenced within the next few weeks. The line will begin at Rouyn, P. Q., at the southerly end of a branch line and extend in a general northeasterly direction to a connection with the main line at Senneterre, a total distance of 100.5 miles.

PENNSYLVANIA-NEW YORK, CHICAGO & ST. LOUIS.—The New York Public Service Commission has approved a low bid of $120,653 submitted by the Ferguson & Edmondson Company, Pittsburgh, Pa., for the elimination of the Big Tree road crossing of these roads in the town of Hamburg, N. Y. The commission directed the railroads to award the necessary contract and to begin the work as soon as practicable. See *Railway Age*, April 11, page 635.

TEXAS & PACIFIC.—A contract has been awarded to the Austin Bridge Company, Dallas, Tex., for the construction of the substructure of a 150-ft. swing draw span at Bayou Grosse Tete, La. The new bridge is being constructed to replace an existing structure. This project will involve a total expenditure of about $90,000.

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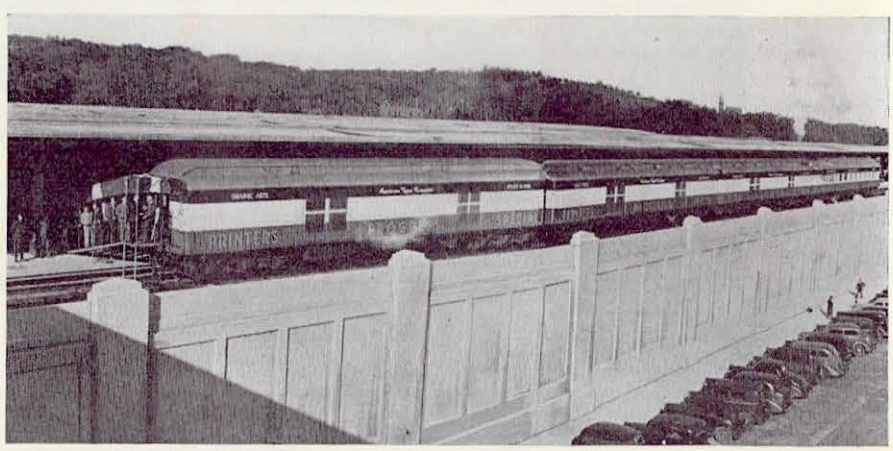

The "Printers Progress Special" at the New York Central's New Syracuse, N. Y., Station on September 25

This exhibition train, sponsored by the American Type Founders, with 24 co-operating companies, left New York on September 14 for a 100-days' tour of 72 cities. It has already completed its tour of New England where attendance was about 225 per cent of expectations.

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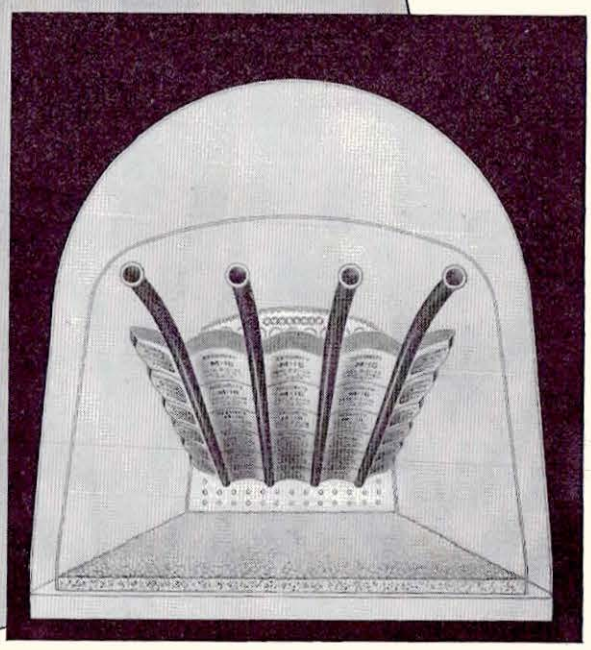
Service . . .

WITH A REAL MEANING



American Arch Company service starts with the design. As locomotive design varies, so, too, the Security Arch design varies to assure the best possible economy.

Next comes the knowledge of ceramics that insures Security Brick of the highest quality.

Following is the service of supply—the responsibility for adequate stocks readily available.

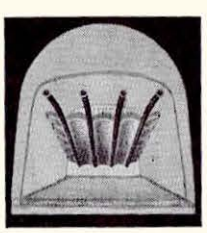
And finally there is the checking up by Arch Service men to be sure the brick is used economically.

There's More to SECURITY ARCHES *Than Just Brick*

In every step the American Arch Company "follows thru" to relieve the railroads of all annoying detail.

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists



AMERICAN ARCH CO.
INCORPORATED

Locomotive Combustion Specialists » » »

Equipment and Supplies

LOCOMOTIVES

THE ATCHISON, TOPEKA & SANTA FE has ordered one 4-6-4 type locomotive and one 4-8-4 type locomotive, from the Baldwin Locomotive Works.

THE BIRMINGHAM SOUTHERN has ordered five Diesel-electric locomotives of 900 hp. from the Electro-Motive Corporation. Inquiry for the equipment was reported in the *Railway Age* of August 22.

THE DETROIT & TOLEDO SHORE LINE has ordered two locomotives of the 2-8-2 type from the Lima Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of August 29.

KANSAS CITY SOUTHERN.—The directors of this road have tentatively approved and referred to the executive committee an equipment purchase program involving approximately $4,000,000, for 10 freight locomotives, 5 passenger cars and some freight cars.

FREIGHT CARS

THE DONORA SOUTHERN is inquiring for 20 air dump cars of 70 tons' capacity.

THE TEXAS COMPANY is inquiring for four tank cars of 10,000 gal. capacity for export.

THE CHICAGO & EASTERN ILLINOIS has ordered 500 box cars of 50 tons' capacity from the General American Transportation Corporation.

THE WABASH has been authorized by the federal district court to build 400 hopper cars of 55 tons' capacity. Work will be done by a subsidiary, to be organized under the name of the Wabash Car & Equipment Company.

THE READING COMPANY will build 200 specially designed, all-steel, drop end gondola cars and 200 specially designed, all steel, automobile box cars in its Reading (Pa.) shops. About 300 men will be given employment at these shops during the construction of the 400 cars.

PASSENGER CARS

THE CHESAPEAKE & OHIO is inquiring for three combination passenger and baggage cars.

IRON & STEEL

THE CENTRAL OF GEORGIA has ordered 5,000 tons of rails, 250,000 tie plates, 1,600 kegs of bolts and 3,000 kegs of spikes from the Tennessee Coal, Iron & Railroad Company.

THE MISSOURI PACIFIC has been authorized by the federal district court at St. Louis, Mo., to purchase 2,000 tons of 112-lb. rails, and tie plates, rail anchors and other accessories, to cost $180,600.

Supply Trade

L. L. Stewart, formerly lighting designer for the Pullman Company, Chicago, has been placed in charge of the design and sales of lighting fixtures for the **Adams & Westlake Company,** Chicago.

Cutler-Hammer, Inc., Milwaukee, Wis., has extended its manufacturing facilities to the West Coast. A new plant, at 970 Folsom street, San Francisco, Cal., began operation this month under the direction of **R. R. Crooke.**

George H. Bucher, vice-president of the **Westinghouse Electric & Manufacturing Company** has been elected executive vice-president of the company. Mr. Bucher who is also president and general manager of the **Westinghouse Electric International Company** will have his headquarters at Pittsburgh, Pa.

Norman V. Arntzen has been appointed sales engineer, northwestern district, for **Hubbard & Company,** Pittsburgh, Pa. Mr. Arntzen will have his headquarters at Portland, Ore., confining his sales engineering work to the states of Oregon and Washington. He will report to Hubbard & Company's Pacific Coast plant at Oakland, Cal.

David Dasso, recently elected vice-president of the **American Locomotive Company, Diesel Engine Division,** was born in Lima, Peru, in 1891. He attended the School of Engineers, Lima, Peru, one year in the department of engineering, University of Illinois, and in 1912 graduated in mechanical engineering at the Massachusetts Institute of Technology. After a trip through Europe, inspecting machinery manufacturing plants, he returned to Lima, Peru, and took over the management of the Vulcan Iron Works,

David Dasso

Peru's most important machine shop and foundry. Shortly after taking over the management of the Vulcan Iron Works, he secured the agencies for various select lines of imports, including automobiles, trucks, and Diesel engines. As a corollary to the automobile equipment he inaugurated the first service station in South America. Later he secured the agency of Sulzer Brothers, Ltd., of Winterthur, Switzerland. Subsequently, Mr. Dasso was engaged in the installation of industrial and governmental projects in South America. In the fall of 1932, he was appointed Sulzer Brothers representative in New York, which position he held, with the exception of one year, 1935-1936, when he was managing director of Sulzer Brothers office in Buenos Aires, until his present election as vice-president, American Locomotive Company, Diesel Engine Division.

R. B. McColl, who has been elected president, member of executive committee, and director of **Alco Products, Inc.,** was born in 1882 at Kilmarnock, Scotland, where he attended the Kilmarnock Academy and the Science and Art College. After serving a special apprenticeship and

Blank & Stoller

R. B. McColl

working in various departments on the Glasgow & Southwestern, he was employed by Robert Stephenson & Sons, locomotive builders, Darlington, England, as a draftsman. In 1905 he went to the Montreal Locomotive Works, Ltd., Montreal, Canada, and served in several departments until he became assistant superintendent, then superintendent of works and finally works manager. In 1917 he was appointed manager of the Munitions Department of the Eddystone Munition Company, where he served until after the Armistice. Returning to England he was appointed general manager of the Armstrong Witworth Company's locomotive department in charge of the building and equipping of the locomotive works and of the sales, engineering and manufacturing of locomotives. Later, in addition, he was made general manager of the pneumatic tool department, gas and oil engine department, and director of the Works Board of all the company's plants, which included shipbuilding and the construction of Diesel-oil engines for marine work, etc. Mr. McColl is still a member of the Institute of Mechanical Engineers, London, England. In January, 1922, he became attached to the New York office of the American Locomotive Company, the following June he was appointed assistant manager of the Schenectady plant, and in January, 1925, manager of the plant. In 1931, he was elected president and director of the McIntosh & Seymour Corporation, Auburn, N. Y., a division of the Ameri-

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THE ELESCO EXHAUST STEAM INJECTOR

Decreases Fuel Consumption 8%-12%
Decreases Water Consumption 8%-12%

•

Low In First Cost
Low In Maintenance Cost

•

20,000 Exhaust Steam Injectors have been applied to locomotives throughout the world.

THE SUPERHEATER COMPANY

Representative of American Throttle Company, Inc.
60 East 42d Street, NEW YORK
Peoples Gas Building, CHICAGO
Canada: The Superheater Company, Limited, Montreal

Superheaters—Superheated Steam Pyrometers—Exhaust Steam Injectors—Feed Water Heaters—American Throttles—Steam Dryers

ELESCO

A-1092

Made by the World's *Largest* Manufacturer of Locomotive Heat Transfer Equipment

can Locomotive Company. Recently, when the McIntosh & Seymour Corporation was merged with the parent company, Mr. McColl was appointed vice-president of the American Locomotive Company, Diesel Engine Division, which position he held at the time of his election as president of Alco Products, Inc.

OBITUARY

Dr. Samuel M. Kintner, vice-president in charge of engineering of the Westinghouse Electric & Manufacturing Co., died on September 28 at his home in Pittsburgh, Pa. He was born at New Albany, Ind., and was graduated from Purdue University in 1894 with a degree of B.S. in mechanical engineering. In recognition of his engineering achievements, the University of Pittsburgh in 1930 conferred upon him the honorary degree of doctor of science. During 1894 and 1895

Dr. Samuel M. Kintner

Dr. Kintner was in the telephone construction and operation service and from 1895 to 1903 served on the faculty of the Western University of Pennsylvania, now the University of Pittsburgh, associated with the late Prof. R. A. Fessenden, serving as instructor and later as professor in the department of electricity, during which time he made original investigations in X-ray, radio telegraph, etc. In 1903 he joined the Westinghouse Electric & Manufacturing Co., as research engineer and later was with the railway engineering department in charge of a.c. motor design. He then served from 1911 to 1917 as general manager of the National Electrical Signaling Company, which was organized to develop commercially the discoveries and patents of Prof. Fessenden and when this company was reorganized as the International Radio Telegraph Co., Dr. Kintner was made vice-president and later became president of the company. He returned to the service of the Westinghouse Electric & Manufacturing Company in 1920 and two years later was appointed manager of its research department, where he remained until April, 1930, when he was appointed assistant vice-president in charge of engineering activities and since April, 1931, he had served as vice-president in charge of all engineering activities of the company. At the time of his death he was a member of the American Institute of Electrical Engineers and a number of other technical organizations.

TRADE PUBLICATION

JOHNS-MANVILLE INDUSTRIAL PRODUCTS.—The 1936 edition of the Industrial Products catalogue issued by the Johns-Manville Corporation, New York, is a 60-page, profusely-illustrated booklet which contains information, recommendations and specifications with regard to the wide range of products manufactured by this company for industrial use. Some of the products or subjects given more prominent attention included high and low temperature insulations suitable for various industrial needs, bonded asbestos built-up roofs, insulated roofs, corrugated Transite roofing and siding, packings, electrical and industrial friction materials, Transite conduit and Transite pressure pipe for water lines. Special consideration is also given to Steeltex floor lathe, welded wire reinforcing, and to sound control for mechanical equipment. Among the new products described are Transite Korduct, rock cork pipe covering, and J-M Ohmstone.

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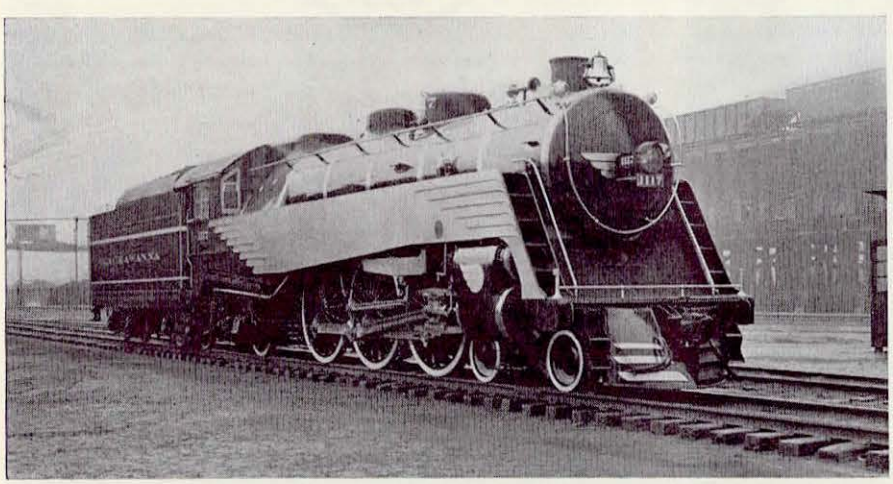

A Delaware, Lackawanna & Western Pacific Type Passenger Locomotive Remodeled at that Road's Scranton (Pa.) Shops to Effect a Semi-Streamline Exterior—The Finish Is in Black with Chromium Striping, Trim and Skirting Below the Running Boards and Silver-leaf Lettering and Striping on the Tender

Financial

CALIFORNIA & OREGON COAST.—*Acquisition.*—The city of Grants Pass, Ore., has applied to the Interstate Commerce Commission for authority to acquire the property of this company, which has a line of 14.6 miles from Grants Pass to Waters Creek, Ore., as part of a plan for extending the line to Crescent City, Calif. The city of Grants Pass and the Crescent City Harbor District had previously filed an application for a certificate for the construction of the proposed extension from Crescent City to Waters Creek, 81.6 miles, stating that application had been made to the Works Progress Administration and the Reconstruction Finance Corporation for a federal grant and loan for the purpose.

CHICAGO GREAT WESTERN.—*Reorganization Plan.*—A reorganization plan, reducing fixed charges and total capitalization, was filed by trustees of this company in the federal district court in Chicago on September 29, and later with the Interstate Commerce Commission. Under the plan the long term debt and capital accounts of the reorganized company would total $70,000,000 authorized and $58,800,850 issued, contrasted with a total indebtedness of over $127,000,000 at present. The reorganized company would sell $31,500,000 of new first mortgage bonds at not less than par to provide working capital and reserve for interest. Preferred stock outstanding would be reduced from $47,073,500 to $20,000,000 of new $100 par non-cumulative preferred, and the common would be cut from $45,209,400 to $15,000,000 of new $25-par common. The $35,544,000 of present 50-yr. first mortgage bonds outstanding, due September 1, 1959, would be replaced in part by $20,000,000 of new first mortgage bonds and $15,000,000 of new general income bonds.

The plan provides for holders of the present first mortgage 4 per cent bonds to receive 25 per cent of the principal in new first mortgage 4 per cent 100-yr. bonds, series "B," 25 per cent in new general income 4 per cent 100-yr. bonds, and 50 per cent in new preferred stock. Holders of the present preferred stock would receive one share of new common stock for each share of old preferred, while holders of the present common would receive one share of new common for each five shares of old. The $1,288,162 of Reconstruction Finance Corporation loans and the $1,171,500 of Railroad Credit Corporation loans would be paid off in full in either new bonds or cash.

Fixed charges for the year immediately following reorganization would total $851,587, as compared with present fixed obligations of $1,900,000. The new charges will comprise interest and principal installment on 3½ per cent series "A" first mortgage bonds and interest on the 4 per cent bonds, not to exceed $1,855,000 and to mature serially over a period of 10 years, which would be issued to pay claims of the Pullman-Standard Car Manufacturing Company. Including interest on the general income bonds and dividends on the new preferred and common stock, maxi-

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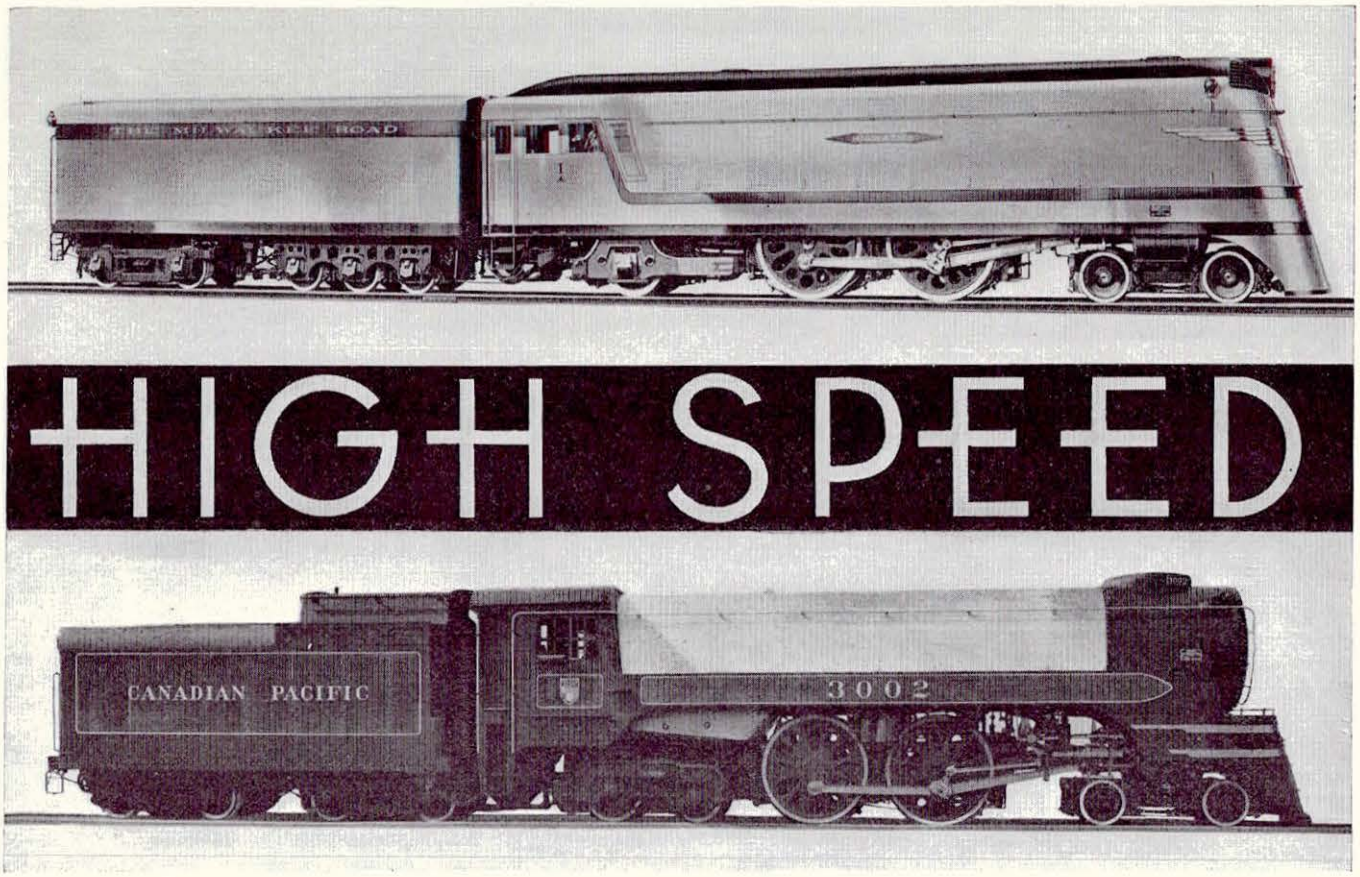


FOR high speed passenger service over long runs, with due consideration for the comfort and safety of the traveler, and economy for the operating company, the American Locomotive Company is more convinced than ever that the modern steam locomotive is best suited to the principles demanded by good railroading. » » » »

ALCO

AMERICAN LOCOMOTIVE COMPANY

30 CHURCH ST., NEW YORK, N.Y.

mum requirements the first year after reorganization would be $2,423,332.

FLORIDA EAST COAST.—*Abandonment.*—Division 4 of the Interstate Commerce Commission has issued a certificate granting the recent application of the receivers for authority to abandon the Key West extension, from Florida City, Fla., to Key West, 125 miles, portions of which had been destroyed by storms.

LOUISVILLE & NASHVILLE.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon, and the Nashville, Chattanooga & St. Louis to abandon operation, of a branch extending from Lexington, Tenn., to Perryville, 24.1 miles.

MISSOURI PACIFIC.—*Trustee Asks Higher Compensation.*—Guy A. Thompson, trustee, has filed a petition asking the Interstate Commerce Commission to reconsider its order prescribing $25,000 as his maximum compensation, pointing out that his duties have been increased considerably since the commission's order and still further since the resignation of L. W. Baldwin as co-trustee.

NEW YORK CENTRAL.—*R. F. C. Loan.*—After having made a repayment of $2,420,262 on September 18 on its loans from the Reconstruction Finance Corporation this company has applied to the Interstate Commerce Commission for approval of the release of collateral pledged for the loans amounting to $3,036,000 par value. The balance of the loans is now $9,478,737 and has been extended to July 1, 1941.

NEW YORK, NEW HAVEN & HARTFORD.—*Equipment Trust.*—The Interstate Commerce Commission has authorized the receivers of this company to assume liability for $3,075,000 of 3 per cent equipment trust certificates, maturing in installments 1937-51, the issue to be sold to the highest bidder (Whiting, Weeks & Knowles, Inc., and associates) at 100.273, making the annual interest cost 2.96 per cent.

WACO, BEAUMONT, TRINITY & SABINE.—*Abandonment.*—This company and the receiver have applied to the Interstate Commerce Commission for authority to abandon the line from Trinity, Tex., to Colmesneil, 66.6 miles.

WESTERN PACIFIC.—*Trustees' Certificates.*—The trustees have applied to the Interstate Commerce Commission for authority to issue and sell $3,000,000 of 4 per cent trustees' certificates for the purpose of paying outstanding certificates at maturity and also $3,700,000 of similar certificates for miscellaneous improvements.

Dividends Declared

Atlantic Coast Line.—Preferred, $2.50, semi-annually, payable November 10 to holders of record October 23.

Reading.—50c, quarterly, payable November 12 to holders of record October 15.

Average Prices of Stocks and of Bonds

	Sept. 29	Last week	Last year
Average price of 20 representative railway stocks..	55.71	56.25	35.21
Average price of 20 representative railway bonds..	83.13	83.88	73.35

Railway Officers

EXECUTIVE

G. S. Lee, vice-president in charge of traffic for the Railway Express Agency, has retired and has been succeeded by **C. A. Frey,** formerly assistant to vice-president in charge of traffic. **J. H. Butler,** general manager, department of public relations, has been appointed traffic executive.

G. D. Wadsworth, general manager of the Quebec Central, with headquarters at Sherbrooke, Que., has been elected president of the Temiscouata railway, succeeding **J. H. Walsh,** who has retired at his own request. **A. H. Bradford,** treasurer and general accountant of the Quebec Central, with headquarters at Sherbrooke, has been elected vice-president of the Temiscouata.

FINANCIAL, LEGAL AND ACCOUNTING

L. A. Foster has been appointed auditor of the Yosemite Valley, with headquarters at Merced, Cal., succeeding **J. W. Swords,** who has resigned.

R. E. Plummer, special accountant in the controller's office of the Southern Pacific, has been appointed assistant to controller, with headquarters at New York, effective October 1.

J. L. Fenton has been appointed real estate, claim and tax agent for the Wheeling & Lake Erie and the Lorain & West Virginia, with headquarters at Canton, Ohio, succeeding **P. K. Soffel,** deceased.

Jervis Langdon, Jr., who has been commerce counsel of the New York Central since 1934, has been appointed assistant general attorney of the Chesapeake & Ohio, with headquarters at Richmond, Va., succeeding **Elmer L. Beach,** deceased. Mr. Langdon was connected with the law department of the Lehigh Valley from 1930 to 1934 and in 1932 was appointed assistant general solicitor.

TRAFFIC

R. S. Wheeler, traffic manager of the Railway Express Agency, has been appointed general traffic manager and **C. F. Messenkopf,** assistant traffic manager, has been appointed traffic manager.

E. D. Mays has been appointed assistant freight traffic manager for the Seaboard Air Line, with headquarters at Tampa, Fla., succeeding **Sam Jones,** deceased.

Eugene N. Thorn, whose appointment as general passenger agent for the Baltimore & Ohio, with headquarters at Baltimore, Md., was noted in the *Railway Age* of September 26, was born on December 23, 1872, at Baltimore. Mr. Thorn was graduated from high school and business college and entered railroad service in August, 1897, as voucher clerk for the Baltimore & Ohio. He was appointed rate clerk in June, 1898; chief rate clerk for

Eugene N. Thorn

the system on September 1, 1920; and chief clerk in the passenger traffic department on March 8, 1922. On July 1, 1925, Mr. Thorn became assistant general passenger agent, the position he held until his recent appointment as general passenger agent.

Arthur W. Richardson, who has been promoted to general freight agent of the Wabash, with headquarters at St. Louis, Mo., was born on March 29, 1898, at Milwaukee, Wis., and entered railway service on October 10, 1919, as a stenographer in the mechanical department of the Wabash at Chicago. After holding the positions of timekeeper in the mechanical department, clerk in the engineering department and stenographer in the transportation department, he was appointed rate clerk in the local freight office at Chicago on December 14, 1922. He held this position until November 24, 1924, when he was transferred to the office of the assistant

Arthur W. Richardson

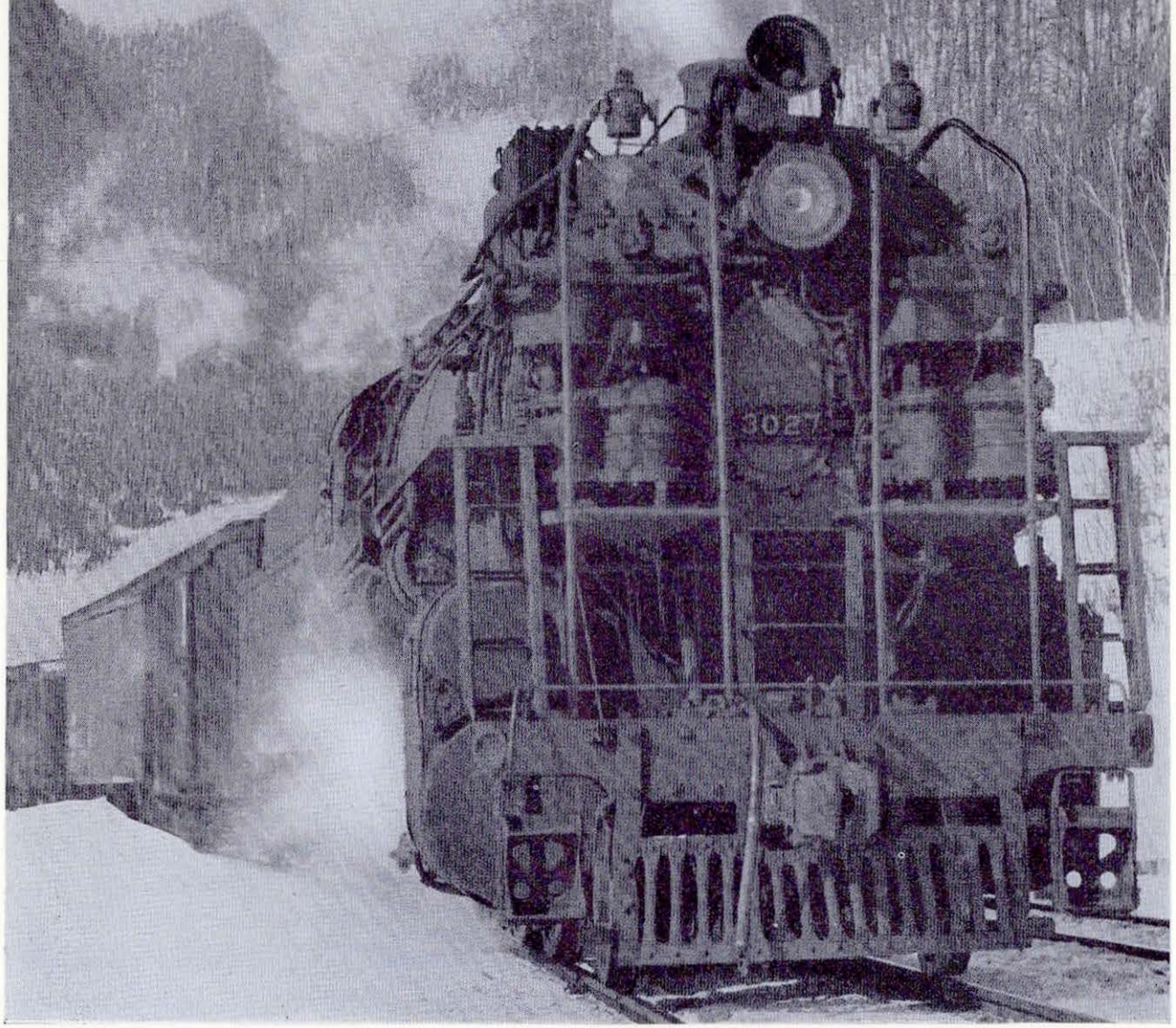
freight traffic manager, Chicago, where he was appointed assistant rate clerk on July 16, 1925, chief rate clerk on January 7, 1926, and representative of the freight department on May 1, 1929. On October 1 of the same year, he was appointed chief

Continued on next left-hand page

"UNION" CENTRALIZED TRAFFIC CONTROL

kept many trains moving last winter
that would have been unavoidably delayed
under train order operation.

THIS WINTER MAY BE EQUALLY SEVERE



1062

1881 Union Switch & Signal Co. 1936
SWISSVALE, PA.
NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

clerk to the freight traffic manager at St. Louis, Mo., and on June 4, 1922, chief clerk in the general freight office at St. Louis, which position he held until his recent promotion.

L. C. Keys, general agent, express and mail department, Atchison, Topeka & Santa Fe, with headquarters at Kansas City, Mo., has been appointed manager of mail and express with headquarters at Chicago, to succeed **J. Brinker,** who has retired. **W. H. McEachern,** traveling freight and passenger agent at Amarillo, Tex., has been appointed general baggage agent of the Panhandle & Santa Fe (part of the Santa Fe System), with the same headquarters, to succeed **Charles P. Walsh,** who has been transferred to the Gulf, Colorado & Santa Fe (also a unit of the Santa Fe System), with headquarters at Galveston, Tex. Mr. Walsh succeeds **J. B. Moore, who has been appointed** general agent, express and mail department, at Kansas City, to succeed Mr. Keys.

Mr. Keys has been connected with the Santa Fe for 32 years. He was born in 1887, at Scott City, Kan., and entered railway service with the Santa Fe in 1904, his first position being that of office boy in the accounting department at Topeka, Kan. Subsequently he was advanced to traveling accountant and in August, 1917, he was sent to Chicago as chief clerk in the office of the express and mail traffic manager. In 1922 Mr. Keys was appointed general agent, express and mail traffic, at Kansas City, Mo., where he was located at the time of his recent appointment as manager of mail and express at Chicago, effective September 1.

E. J. Gleason, assistant general passenger agent on the Baltimore & Ohio at Chicago, who has been appointed general passenger agent at Cincinnati, Ohio, as reported in the *Railway Age* of September 26, has been in railway service for 28 years. At the age of 15 years he became

Koehne

E. J. Gleason

connected with the Grand Trunk Western as a messenger boy, serving in various capacities with this company for 13 years. At the end of this period Mr. Gleason, after a short period of service with the Illinois Central, became identified with the Baltimore & Ohio as traveling passenger agent at Chicago. In 1928 he was sent to Toledo, Ohio, as division passenger agent and in 1929 he was transferred to Detroit, Mich. On February 1, 1924, he was advanced to assistant general passenger agent at Chicago, which position he held until his recent appointment as general passenger agent at Cincinnati, effective October 1.

OPERATING

Don K. Price, assistant superintendent of the Cumberland Valley division of the Louisville & Nashville, who has been promoted to superintendent of the Cincinnati division, with headquarters at Latonia, Ky., as reported in the *Railway Age* of September 26, was born in 1880 at Rensselaer, Ind. He entered railway service on December 1, 1896, as a file clerk in the office of the superintendent of the L. & N. at Middlesboro, Ky. In August, 1901, he was transferred to the general freight

Don K. Price

office at Montgomery, Ala., as a stenographer, and in the following year he was appointed secretary to the superintendent at Pensacola, Fla. In May, 1904, he was sent to Middlesboro on the Cumberland Valley division, where he was subsequently appointed assistant master of trains. On June 1, 1913, he was advanced to master of trains with the same headquarters and on June 1, 1918, he was further promoted to assistant superintendent of the Cumberland Valley division. He was holding the latter position at the time of his recent appointment as superintendent at Latonia.

C. A. Stewart, manager of the Temiscouata railway, has been made general manager, with headquarters at Riviere du Loup, Que.

H. L. Nancarrow, master mechanic of the Philadelphia Terminal division of the Pennsylvania at Philadelphia, Pa., has been promoted to superintendent of the Logansport division, with headquarters at Logansport, Ind., to succeed **W. D. Supplee,** who has been transferred to the Indianapolis division, where he replaces **W. W. Patchell,** who has been transferred to the St. Louis division, with headquarters at Terre Haute, Ind. Mr. Patchell succeeds **J. G. Sheaffer,** who has resigned to become vice president of the St. Louis National Stock Yards Company and the East St. Louis Junction Railway.

ENGINEERING AND SIGNALING

Alonzo W. Epright, supervisor of scales and weighing of the Pennsylvania, with headquarters at Altoona, Pa., was retired from active duty on September 30, after 45 years of service with the company. Mr. Epright is succeeded as supervisor of scales and weighing, with headquarters at Altoona, by **M. J. J. Harrison,** general inspector of scales, at Chicago.

SPECIAL

K. N. Merritt, assistant general manager, department of public relations, of the Railway Express Agency, has been appointed general sales manager for the R. E. A., heading the new sales department, the functions of which are outlined in an article appearing elsewhere in this issue.

OBITUARY

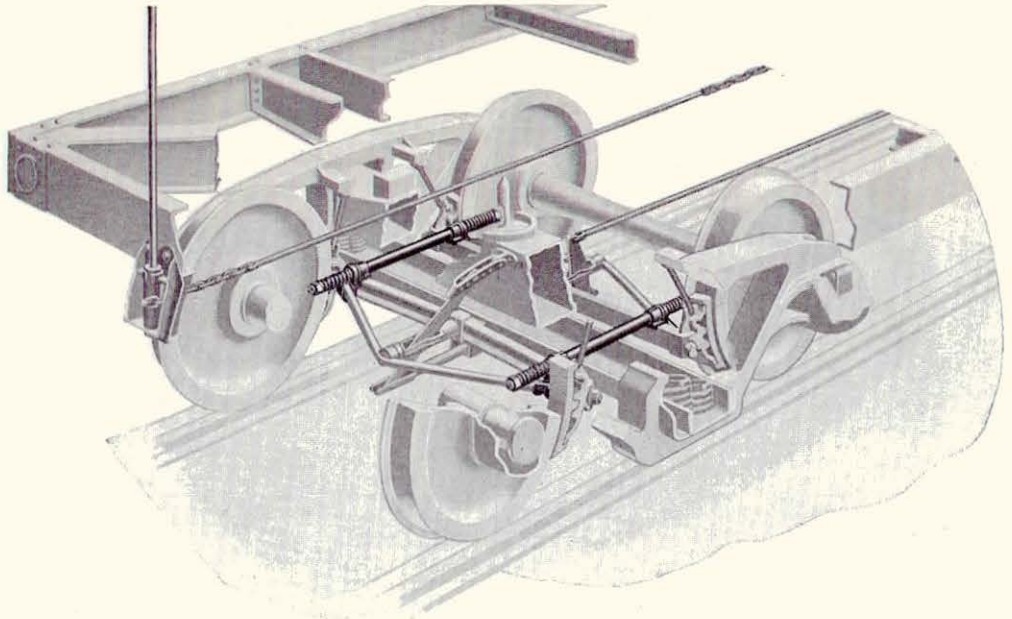
Peter C. Hart, who retired in 1918 as general manager of the Chicago, Milwaukee, St. Paul & Pacific, died at his home at Chicago on September 26 at the age of 76 years.

Frank P. Barr, retired general traffic manager of the Wheeling & Lake Erie and former president of the Traffic Club of Cleveland, Ohio, died September 19, at his home in Bedford, a suburb of Cleveland. He was 58 years of age and had been ill two months. Mr. Barr, born in Canton, Ohio, had lived in Bedford and worked in Cleveland for more than 20 years. After 36 years of service with the

Frank P. Barr

Wheeling & Lake Erie, beginning July, 1895, as clerk in the car record office, he retired in 1931. From 1914 to 1918, he was superintendent of transportation; from 1918 to 1920, assistant to general manager and, during the federal control period, assistant to the federal manager. From 1921 until his retirement ten years later, he was general traffic manager.

Table of Freight Operating Statistics appears on next left-hand page



During the first 8 months of 1936 — railroads and private car lines ordered

21476 CARS

OF GRIP NUT COMPANY'S BRAKE BEAM SAFETY SUPPORTS

BECAUSE:

1. It is the only support on the market that is guaranteed.
2. It eliminates maintenance expense.
3. It reduces cost of brake beam changes under A.A.R. Rules.
4. It reduces brake shoe wear.
5. It reduces wear on pins, hangers, and brake heads.
6. It reduces shoe resistance in starting long, heavy trains.
7. It reduces application labor costs.

WHY NOT

Specify Grip Nut Company's Brake Beam Safety Supports on your new car specifications, and on addition and betterment programs, insuring these advantages and economies on your road?

GRIP NUT COMPANY

5917 South Western Avenue **Chicago, Illinois**

Freight Operating Statistics of Large Steam Railways—Selected Items for the Month of June,

Region, road, and year	Miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (*thousands*)	Car-miles: Per cent loaded	Ton-miles (*thousands*): Gross, excluding locomotives and tenders	Ton-miles (*thousands*): Net, revenue and non-revenue	Number of road locomotives on line: Serviceable: Not stored	Serviceable: Stored	Unserviceable	Per cent unserviceable
New England Region:												
Boston & Albany....1936	373	122,486	127,248	8,734	3,045	67.3	159,849	53,624	49	10	33	35.9
1935	373	113,768	117,868	7,856	2,864	67.0	149,576	50,335	51	12	33	34.4
Boston & Maine....1936	1,963	261,934	292,716	28,206	8,991	69.2	487,075	180,060	118	6	162	56.6
1935	1,986	249,761	279,409	28,101	8,930	70.9	476,450	184,688	102	4	173	62.0
N. Y., New H. & Hartf...1936	2,011	339,649	408,059	19,786	11,277	66.2	609,337	219,705	180	7	105	34.7
1935	2,050	340,536	414,219	20,131	11,159	65.4	611,960	226,120	178	14	109	36.2
Great Lakes Region:												
Delaware & Hudson....1936	831	205,703	270,332	28,801	6,893	65.5	419,084	194,442	90	147	41	14.7
1935	835	209,573	285,347	31,934	7,310	64.5	452,103	213,253	82	167	36	12.6
Del., Lack. & Western....1936	983	361,526	398,945	53,386	11,513	65.5	684,148	263,885	146	1	93	38.8
1935	992	324,684	365,183	48,142	10,798	66.5	638,972	261,316	117	45	88	35.2
Erie (incl. Chi. & Erie)...1936	2,298	662,658	704,746	37,063	28,500	65.2	1,721,495	635,005	209	49	216	45.6
1935	2,305	653,108	688,628	46,901	27,080	64.8	1,666,620	637,697	219	66	193	40.4
Grand Trunk Western....1936	1,027	263,031	264,515	3,042	6,887	62.8	414,444	142,861	85	..	55	39.3
1935	1,007	220,753	223,237	1,827	6,276	62.6	374,259	128,462	72	..	69	48.9
Lehigh Valley 1936	1,312	382,370	404,804	45,744	12,585	66.0	774,215	319,628	123	1	160	56.3
1935	1,335	356,451	381,866	39,995	11,678	65.9	732,378	309,336	138	7	163	52.9
New York Central....1936	10,789	2,521,844	2,648,924	162,128	84,055	59.7	5,403,062	2,147,840	839	145	534	35.2
1935	10,919	2,284,256	2,405,917	142,712	77,746	61.0	4,946,710	2,042,274	734	169	621	40.7
New York, Chi. & St. L...1936	1,672	456,851	461,541	6,809	15,959	64.0	945,586	341,700	138	23	32	16.6
1935	1,661	401,600	404,675	4,706	13,867	64.8	809,903	294,519	124	52	15	7.9
Pere Marquette 1936	2,081	356,363	366,885	5,403	9,091	60.8	580,126	212,454	119	3	31	20.3
1935	2,096	314,167	330,710	2,798	7,935	62.4	503,336	193,278	107	6	44	28.0
Pitts. & Lake Erie....1936	234	74,165	76,604	14	2,948	63.3	246,606	141,703	27	13	29	42.0
1935	234	68,872	70,219	.....	2,847	58.2	248,687	139,817	21	11	39	54.9
Wabash 1936	2,435	571,466	580,452	11,792	17,441	64.2	1,020,069	342,490	129	37	143	46.3
1935	2,435	499,770	505,878	10,234	15,400	64.5	883,991	289,189	126	36	170	51.2
Central Eastern Region:												
Baltimore & Ohio....1936	6,366	1,470,608	1,790,241	174,445	44,693	62.4	3,040,911	1,356,650	651	29	610	47.3
1935	6,321	1,260,522	1,542,123	176,045	38,768	62.8	2,613,882	1,183,063	606	138	566	43.2
Central of New Jersey....1936	681	140,448	157,614	29,059	4,498	61.2	301,607	137,995	57	14	76	51.7
1935	684	141,139	161,124	30,818	5,030	60.5	355,677	176,678	59	10	87	55.8
Chicago & Eastern Ill....1936	931	164,939	165,745	2,596	4,051	68.0	238,999	99,229	52	3	53	49.1
1935	939	150,868	151,363	2,434	3,520	66.2	215,786	91,963	44	5	60	55.0
Elgin, Joliet & Eastern....1936	434	91,168	91,828	1,383	2,350	63.4	175,317	88,482	56	..	30	34.9
1935	446	83,911	85,462	713	1,988	61.5	152,875	75,886	50	2	35	40.2
Long Island 1936	393	27,231	27,760	15,738	270	51.2	20,835	8,121	28	5	17	34.0
1935	393	26,931	27,589	14,367	264	53.8	19,491	7,692	30	..	23	43.4
Pennsylvania System 1936	9,801	2,932,874	3,321,532	353,210	101,565	62.3	6,840,339	2,987,744	1,383	162	849	35.5
1935	10,009	2,662,072	3,019,687	333,046	97,163	63.3	6,510,391	2,930,895	1,213	244	999	40.7
Reading 1936	1,449	386,030	419,484	49,208	10,564	60.7	759,757	352,020	187	60	96	28.0
1935	1,452	399,203	435,293	50,490	11,582	60.1	860,461	421,694	186	81	101	27.4
Pocahontas Region:												
Chesapeake & Ohio....1936	3,050	826,198	867,217	35,625	38,202	55.4	3,226,384	1,732,695	393	62	75	14.2
1935	3,050	807,156	851,352	36,645	36,854	56.8	3,070,038	1,662,598	351	108	102	18.2
Norfolk & Western....1936	2,145	618,086	651,753	32,354	25,196	59.1	2,089,545	1,090,505	266	64	40	10.8
1935	2,145	611,926	640,643	28,186	24,913	59.8	2,094,847	1,100,736	233	102	51	13.2
Southern Region:												
Atlantic Coast Line....1936	5,100	580,110	582,214	7,408	11,559	65.1	616,564	219,557	218	67	110	27.8
1935	5,148	566,663	570,134	7,468	11,957	63.5	626,693	212,637	261	50	135	30.3
Central of Georgia....1936	1,886	245,647	247,687	3,577	5,208	70.7	284,283	104,839	105	..	22	17.3
1935	1,886	228,612	229,615	4,129	5,058	67.9	277,239	103,565	103	..	38	27.0
Illinois Central (incl. 1936	6,562	1,551,605	1,568,482	28,689	36,952	62.7	2,295,860	892,984	624	14	223	25.9
Y. & M. V.)....1935	6,587	1,371,334	1,382,465	27,091	33,077	63.8	2,046,163	823,521	619	8	273	30.3
Louisville & Nashville....1936	4,998	1,036,630	1,133,798	29,060	24,871	60.3	1,727,907	816,549	337	24	204	36.1
1935	5,046	951,780	1,028,058	26,096	21,884	61.0	1,501,081	711,883	310	9	267	45.6
Seaboard Air Line....1936	4,295	426,542	442,264	3,946	10,378	66.4	578,986	209,126	220	7	98	30.2
1935	4,295	415,116	419,311	4,254	9,708	64.5	550,711	196,002	202	13	124	36.6
Southern 1936	6,596	1,209,806	1,227,999	19,165	27,449	68.5	1,477,280	565,112	470	35	289	36.4
1935	6,599	1,093,268	1,106,525	18,495	24,632	68.5	1,305,582	490,165	417	53	335	41.6
Northwestern Region:												
Chi. & North Western....1936	8,355	1,003,947	1,045,556	26,506	26,719	63.6	1,651,799	601,178	353	111	223	32.5
1935	8,428	863,564	916,263	23,101	22,247	65.1	1,344,249	478,311	422	85	252	33.2
Chicago Great Western....1936	1,458	222,802	223,710	7,499	6,967	64.9	412,037	152,604	60	..	27	31.0
1935	1,456	210,244	210,330	6,428	6,041	61.0	370,028	130,793	57	4	38	38.4
Chi., Milw., St. P. & Pac...1936	11,121	1,315,784	1,402,075	60,655	35,944	62.3	2,266,361	894,194	458	87	139	20.3
1935	11,119	1,114,535	1,178,085	51,399	29,274	61.1	1,842,603	723,469	367	99	186	28.5
Chi., St. P., Minneap. & Om.1936	1,637	212,139	221,115	9,921	4,952	67.9	298,546	119,735	86	38	20	13.9
1935	1,641	182,051	186,023	8,341	3,882	69.3	222,504	87,246	62	42	40	27.8
Great Northern 1936	8,080	745,752	743,883	25,427	25,580	60.5	1,780,340	819,390	363	49	184	30.9
1935	8,041	610,690	614,168	14,182	19,826	63.8	1,306,424	602,974	329	85	186	31.0
Minneap. St. P. & S. St. M.1936	4,273	365,856	372,865	3,590	8,704	68.7	506,469	217,564	118	..	37	23.9
1935	4,274	340,493	343,808	2,156	7,508	69.7	412,035	175,170	132	..	31	19.0
Northern Pacific 1936	6,429	693,371	755,173	51,811	20,295	66.0	1,246,636	511,863	339	16	87	19.7
1935	6,416	541,869	587,715	36,899	15,215	67.2	906,723	350,177	328	10	114	25.2
Central Western Region:												
Alton 1936	928	197,583	209,271	1,244	4,567	60.7	294,887	108,432	66	3	29	29.6
1935	921	187,386	190,010	1,759	3,998	58.7	262,574	88,381	64	..	38	37.3
Atch., Top. & S. Fe (incl. 1936	13,228	1,812,713	1,968,500	104,241	52,695	63.1	3,285,695	1,080,809	554	93	329	33.7
G., C. & S.F. & P. & S.F.).1935	13,308	1,585,705	1,673,645	67,965	44,048	63.5	2,661,344	858,927	495	124	371	37.5
Chi., Burl. & Quincy....1936	8,937	1,182,120	1,230,706	44,219	31,442	63.2	1,864,685	765,795	423	3	111	20.7
1935	8,971	1,048,178	1,104,595	40,147	27,198	64.5	1,591,982	686,506	432	13	95	17.6
Chi., Rock I. & Pac. (incl. 1936	8,176	1,206,660	1,230,062	5,831	27,175	61.5	1,672,526	594,055	384	13	311	43.9
Chi., Rock I. & Gulf)....1935	8,272	971,353	984,281	5,994	22,089	61.5	1,335,578	472,386	369	13	346	47.5
Denver & R. Gr. Western..1936	2,584	250,670	274,142	26,726	6,662	68.3	405,344	170,456	156	15	30	14.9
1935	2,584	201,085	217,252	22,769	5,360	68.5	315,605	132,297	146	23	49	22.5
Southern Pac.—Pac. Lines.1936	8,614	1,493,326	1,623,284	184,076	48,567	61.5	3,083,264	971,472	518	66	198	25.3
1935	8,599	1,151,384	1,246,914	137,636	39,110	61.3	2,466,418	777,569	393	123	261	33.6
Union Pacific† 1936	9,824	1,473,672	1,526,009	85,539	48,763	67.9	2,889,403	1,051,071	578	73	220	25.3
1935	9,832	1,419,551	1,472,912	82,064	44,173	66.4	2,559,638	932,087	537	98	253	28.5
Southwestern Region:												
Mo.-Kans. Texas Lines 1936	3,282	386,366	392,291	6,222	10,668	59.6	660,510	221,450	101	22	80	39.4
1935	3,282	355,368	359,051	5,304	9,265	61.1	562,553	191,221	84	24	86	44.3
Missouri Pacific 1936	7,201	1,127,334	1,167,442	24,656	31,395	62.3	1,972,476	742,700	334	73	135	24.9
1935	7,208	1,029,163	1,063,913	22,476	27,314	63.5	1,681,511	631,981	263	123	162	29.6
St. Louis-San Francisco....1936	4,888	718,893	725,455	10,318	15,170	63.9	922,129	363,109	282	87	55	13.0
1935	4,993	636,372	645,822	8,281	13,271	63.2	793,463	306,640	260	116	61	14.0
St. Louis-Southw. Lines....1936	1,768	308,237	312,914	4,049	8,539	58.1	529,858	158,059	102	8	8	6.8
1935	1,774	266,851	271,778	3,632	6,733	59.1	405,568	121,052	103	9	9	7.4
Texas & New Orleans....1936	4,416	577,600	578,141	11,784	13,191	60.6	842,664	282,964	197	41	58	19.6
1935	4,420	494,791	495,372	8,290	10,844	60.1	681,659	220,885	180	54	70	23.0
Texas & Pacific....1936	1,945	313,740	313,740	2,098	9,515	59.9	595,556	183,636	65	54	97	44.9
1935	1,945	277,271	277,271	1,563	8,054	57.2	517,112	154,931	74	76	71	32.1

NOTE:—Effective with carrier reports for the month of January, 1936, the rules relative to operating statistics of large steam railways were revised with the following effect on this statement: Miles of road operated, number of locomotives on line, and number of freight cars on line were changed from averages for the month to actual figures as of the close of the month. Freight train and locomotive-miles, which formerly applied only to freight trains and the *freight proportion of mixed trains*, based on car-miles were changed to apply to freight trains and all mixed trains handling more freight-train cars than passenger-train cars. Carriers were not required to rework 1935 figures according to the revised rules, but they have in some cases supplied considerable comparable data. In other cases the figures shown in this statement for last year were restated by the carriers from last year's reports, or inserted from such reports by the Bureau of Statistics.

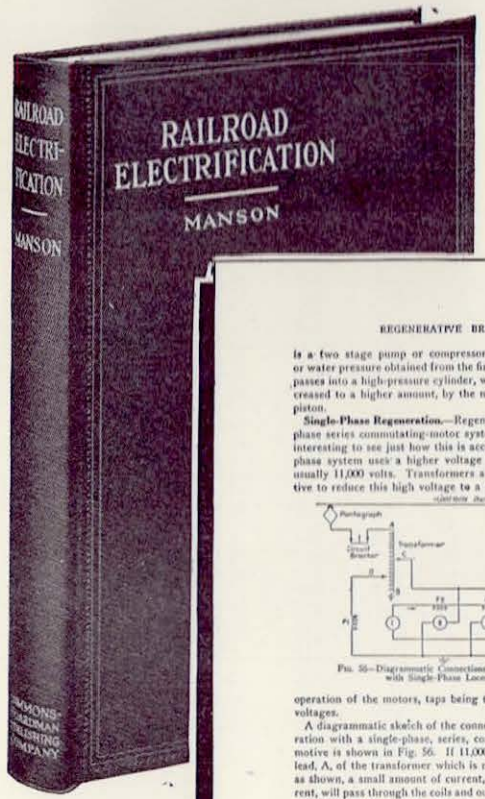
† Includes Los Angeles & Salt Lake, Oregon Short Line, Oregon-Washington R. R. & Navigation Co., and St. Joseph & Grand Island, leased January 1, 1936.

1936, Compared with June, 1935, for Roads with Annual Operating Revenues Above $25,000,000

Region, road, and year	Number of freight cars on line: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotives and tenders	Gross ton-miles per train-mile, excluding locomotives and tenders	Net ton-miles per train-mile	Net ton-miles per loaded car-mile	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive-miles per locomotive-day
New England Region:													
Boston & Albany	1936 2,395	4,510	6,905	22.5	21,540	1,310	440	17.6	263	22.1	4,793	153	49.3
	1935 2,824	4,455	7,279	23.7	21,893	1,320	444	17.6	231	19.6	4,496	153	43.7
Boston & Maine	1936 8,236	7,064	15,300	16.4	25,048	1,867	690	20.0	382	27.6	3,057	98	37.0
	1935 9,182	7,689	16,871	15.0	26,278	1,915	**742**	20.7	375	25.6	3,099	99	36.2
N. Y., New H. & Hartf.	1936 13,575	10,877	24,452	17.8	25,618	1,832	660	19.5	301	23.3	3,642	102	49.2
	1935 14,495	11,383	25,878	15.3	26,140	1,826	675	20.3	291	22.0	3,677	98	48.1
Great Lakes Region:													
Delaware & Hudson	1936 8,421	3,069	11,490	5.7	29,087	2,051	952	28.2	542	29.2	7,802	104	35.2
	1935 10,351	2,931	13,282	5.9	30,110	2,172	1,025	29.2	540	28.7	8,510	106	37.9
Del., Lack. & Western	1936 13,892	6,081	19,973	17.4	31,654	1,919	740	22.9	443	29.5	8,951	125	62.6
	1935 15,500	6,707	22,207	11.2	31,393	2,006	821	24.2	404	25.1	8,782	124	55.1
Erie (incl. Chi. & Erie)	1936 16,883	18,343	35,226	3.8	42,546	2,616	965	22.3	607	41.8	9,213	93	52.2
	1935 22,495	12,166	34,661	6.5	43,144	2,568	983	23.5	618	40.5	9,222	90	51.3
Grand Trunk Western	1936 4,248	6,948	11,196	15.1	30,966	1,590	548	20.7	411	31.5	4,636	88	63.7
	1935 4,517	7,425	11,942	17.2	32,253	1,708	586	20.5	354	27.7	4,254	89	52.5
Lehigh Valley	1936 11,808	8,876	20,684	7.9	36,810	2,063	852	25.4	508	30.3	8,118	114	52.1
	1935 13,758	6,939	20,697	12.1	35,119	2,112	892	26.5	515	29.5	7,722	126	45.5
New York Central	1936 104,779	61,081	165,860	20.7	36,523	2,162	859	25.6	424	27.8	6,636	98	61.2
	1935 123,533	61,948	185,481	18.8	36,884	2,190	904	26.3	367	22.9	6,235	95	55.7
New York, Chi. & St. L.	1936 6,235	7,598	13,833	3.3	38,322	2,072	749	21.4	807	58.8	6,813	85	80.7
	1935 8,540	6,899	15,439	4.3	37,204	2,021	735	21.2	654	47.5	5,912	84	71.4
Pere Marquette	1936 8,689	6,235	14,924	5.4	27,207	1,631	597	23.4	468	32.9	3,402	88	79.8
	1935 10,159	4,486	14,645	4.3	27,422	1,605	616	24.4	432	28.4	3,074	87	70.6
Pitts. & Lake Erie	1936 14,521	11,677	26,198	39.2	47,488	3,343	1,921	48.1	183	6.0	20,200	89	36.5
	1935 16,348	11,962	28,310	42.6	52,654	3,633	2,042	49.1	167	5.9	19,944	87	33.0
Wabash	1936 10,948	9,698	20,646	3.2	36,336	1,799	604	19.6	560	44.3	4,689	99	63.8
	1935 13,064	8,425	21,489	3.5	36,061	1,785	584	18.8	446	36.9	3,960	104	51.7
Central Eastern Region:													
Baltimore & Ohio	1936 68,694	27,872	96,566	15.9	27,921	2,096	935	30.4	468	24.7	7,103	132	50.8
	1935 75,326	20,318	95,644	18.7	27,830	2,105	953	30.5	412	21.5	6,239	137	43.7
Central of New Jersey	1936 10,963	9,648	20,611	32.5	26,522	2,232	1,021	30.7	222	11.8	6,753	141	41.2
	1935 12,777	9,454	22,231	28.5	30,570	2,605	1,294	35.1	266	12.5	8,610	123	40.9
Chicago & Eastern Ill.	1936 3,408	3,091	6,499	7.7	27,058	1,454	604	24.5	500	30.0	3,552	123	51.5
	1935 3,508	2,399	5,907	11.3	26,601	1,437	612	26.1	519	30.0	3,265	122	47.0
Elgin, Joliet & Eastern	1936 8,066	4,586	12,652	5.6	17,481	1,962	990	37.7	228	9.6	6,795	105	36.1
	1935 7,878	2,847	10,725	6.3	18,439	1,872	929	38.2	231	9.9	5,670	110	33.2
Long Island	1936 660	3,341	4,001	2.2	5,557	783	305	30.1	69	4.5	689	308	28.7
	1935 776	2,931	3,707	4.0	5,645	737	291	29.1	68	4.4	653	299	26.6
Pennsylvania System	1936 194,143	62,082	256,225	17.4	34,335	2,369	1,035	29.4	383	20.9	10,161	111	51.1
	1935 238,376	51,849	290,225	15.2	35,397	2,493	1,123	30.2	338	17.7	9,761	108	45.7
Reading	1936 26,134	10,447	36,581	11.0	24,909	1,973	914	33.3	322	15.9	8,098	138	45.0
	1935 28,182	9,047	37,229	8.8	27,855	2,164	1,060	36.4	369	16.9	9,683	130	44.0
Pocahontas Region:													
Chesapeake & Ohio	1936 41,701	12,838	54,539	1.6	56,033	3,946	2,119	45.4	1,044	41.5	18,938	69	56.7
	1935 40,945	11,248	52,193	2.0	54,991	3,844	2,082	45.1	1,062	41.5	18,170	69	52.7
Norfolk & Western	1936 32,495	5,236	37,731	1.9	49,990	3,405	1,777	43.3	979	38.2	16,948	96	61.6
	1935 32,221	4,496	36,717	2.8	52,258	3,451	1,813	44.2	970	36.7	17,102	92	57.7
Southern Region:													
Atlantic Coast Line	1936 18,495	6,541	25,036	23.6	19,062	1,071	381	19.0	272	22.0	1,435	111	49.7
	1935 20,823	5,902	26,725	20.7	20,016	1,116	379	17.8	247	21.8	1,377	114	43.1
Central of Georgia	1936 3,402	4,563	7,965	4.2	21,349	1,165	429	20.1	439	30.8	1,853	116	65.9
	1935 5,934	4,515	10,449	17.4	22,450	1,219	455	20.5	330	23.8	1,831	117	55.3
Illinois Central (incl. Y. & M. V.)	1936 36,153	19,787	55,940	28.5	25,906	1,491	580	24.2	529	34.9	4,536	121	61.9
	1935 41,847	15,572	57,419	35.9	26,270	1,504	606	24.9	471	29.6	4,168	124	51.5
Louisville & Nashville	1936 36,384	10,655	47,039	23.7	25,841	1,669	789	32.8	564	28.5	5,446	120	68.5
	1935 40,326	7,635	47,961	28.1	25,433	1,581	750	32.5	503	24.7	4,702	127	60.2
Seaboard Air Line	1936 9,130	4,934	14,064	2.7	22,771	1,376	497	20.2	488	36.4	1,623	114	45.6
	1935 9,923	3,882	13,805	4.0	22,382	1,349	480	20.2	462	35.4	1,521	113	40.8
Southern	1936 23,108	16,604	39,712	16.8	21,089	1,228	470	20.6	467	33.2	2,856	149	52.2
	1935 24,931	13,718	38,649	12.7	21,117	1,203	452	19.9	404	29.6	2,476	147	46.6
Northwestern Region:													
Chi. & North Western	1936 37,324	22,359	59,683	9.7	25,555	1,649	600	22.5	343	34.0	2,398	112	51.4
	1935 42,401	24,478	66,879	10.7	23,776	1,562	556	21.5	243	17.4	1,892	120	41.3
Chicago Great Western	1936 1,766	4,019	5,785	3.0	30,139	1,850	685	21.9	899	63.2	3,489	122	88.1
	1935 2,004	2,798	4,802	3.1	32,714	1,762	623	21.7	867	65.6	2,994	122	73.0
Chi., Milw., St. P. & Pac.	1936 43,146	21,687	64,833	2.9	27,603	1,730	683	24.9	462	29.9	2,680	114	71.2
	1935 49,898	15,703	65,601	2.8	26,320	1,661	652	24.7	368	24.3	2,169	115	62.9
Chi., St. P., Minneap. & Om.	1936 2,992	5,969	8,961	9.8	18,336	1,414	567	24.2	455	27.7	2,438	107	52.7
	1935 1,704	7,187	8,891	9.0	18,177	1,225	480	22.5	335	21.4	1,772	113	44.7
Great Northern	1936 37,357	10,448	47,805	10.9	36,854	2,415	1,111	32.0	575	29.6	3,380	97	43.5
	1935 41,498	8,951	50,449	9.5	34,419	2,150	992	30.4	398	20.5	2,500	107	34.8
Minneap. St. P. & S. St. M.	1936 12,555	4,712	17,267	5.5	21,988	1,390	597	25.0	428	25.0	1,697	94	81.0
	1935 13,533	4,337	17,870	4.5	19,828	1,214	516	23.3	331	20.4	1,366	101	70.7
Northern Pacific	1936 27,630	5,505	33,135	10.8	28,625	1,809	743	25.2	508	30.5	2,654	139	60.9
	1935 33,508	4,090	37,598	11.3	28,069	1,687	652	23.0	306	19.8	1,819	136	45.9
Central Western Region:													
Alton	1936 2,431	6,622	9,053	23.1	34,526	1,496	550	23.7	412	28.7	3,894	107	71.6
	1935 2,527	6,402	8,929	20.6	32,352	1,407	474	22.1	326	25.1	3,198	111	63.3
Atch., Top. & S. Fe (incl. G., C. & S.F. & P. & S.F.)	1936 65,751	13,746	79,497	9.8	33,276	1,817	598	20.5	448	34.7	2,724	113	70.8
	1935 71,587	10,672	82,259	12.2	31,666	1,682	543	**19.5**	**347**	**28.1**	**2,151**	**116**	**58.6**
Chi., Burl. & Quincy	1936 27,279	16,204	43,483	8.4	27,478	1,586	651	24.4	595	38.7	2,856	113	79.1
	1935 31,493	11,999	43,492	8.2	25,840	1,528	659	25.2	522	32.0	2,551	119	70.7
Chi., Rock I. & Pac. (incl. Chi., Rock I. & Gulf)	1936 24,503	13,592	38,095	8.8	24,709	1,390	494	21.9	525	39.0	2,422	123	57.8
	1935 29,415	12,127	41,542	14.6	23,547	1,379	488	21.4	379	28.8	1,904	128	45.4
Denver & R. Gr. Western	1936 12,853	3,054	15,907	7.9	26,210	1,621	682	25.6	356	20.4	2,199	153	49.2
	1935 13,305	2,885	16,190	5.1	23,908	1,575	660	24.7	272	16.1	1,707	154	36.4
Southern Pac.—Pac. Lines	1936 32,328	27,206	59,534	8.3	33,691	2,078	655	20.0	543	44.1	3,759	99	77.2
	1935 34,214	25,018	59,232	8.4	34,465	2,156	680	19.9	438	35.9	3,014	99	59.4
Union Pacific†	1936 40,089	17,032	57,121	13.2	40,204	1,970	717	21.6	612	41.8	3,566	113	62.0
	1935 42,737	14,823	57,560	16.7	37,393	1,820	663	21.1	540	38.5	3,160	108	57.9
Southwestern Region:													
Mo.-Kans. Texas Lines	1936 4,935	5,596	10,531	6.3	31,514	1,713	574	20.8	700	56.5	2,249	80	65.4
	1935 5,829	3,845	9,674	3.5	27,734	1,587	539	20.6	657	52.1	1,942	82	62.6
Missouri Pacific	1936 16,718	24,113	40,831	3.0	30,952	1,756	661	23.7	648	43.9	3,438	111	73.5
	1935 18,372	17,129	35,501	4.1	28,731	1,639	616	23.1	605	41.2	2,923	119	65.4
St. Louis-San Francisco	1936 18,278	7,696	25,974	7.0	24,963	1,287	507	23.9	466	30.4	2,476	122	57.8
	1935 21,023	5,986	27,009	5.3	22,924	1,254	485	23.1	378	25.9	2,047	127	49.9
St. Louis-Southw. Lines	1936 2,860	3,993	6,853	3.9	31,777	1,723	514	18.5	763	70.9	2,981	85	88.8
	1935 3,543	3,978	7,521	6.0	28,774	1,529	456	18.0	549	51.7	2,275	88	76.5
Texas & New Orleans	1936 7,331	11,803	19,134	7.8	26,700	1,470	494	21.5	488	37.6	2,136	85	66.4
	1935 7,588	10,497	18,085	7.9	24,731	1,389	450	20.4	399	32.5	1,666	91	55.2
Texas & Pacific	1936 2,638	5,478	8,116	3.7	32,477	1,902	587	19.3	774	67.1	3,146	82	48.5
	1935 2,731	4,649	7,380	5.4	31,006	1,868	560	19.2	715	65.1	2,655	80	42.1

Compiled by the Bureau of Statistics, Interstate Commerce Commission. ***Subject to revision.***

Railroad Electrification and the Electric Locomotive



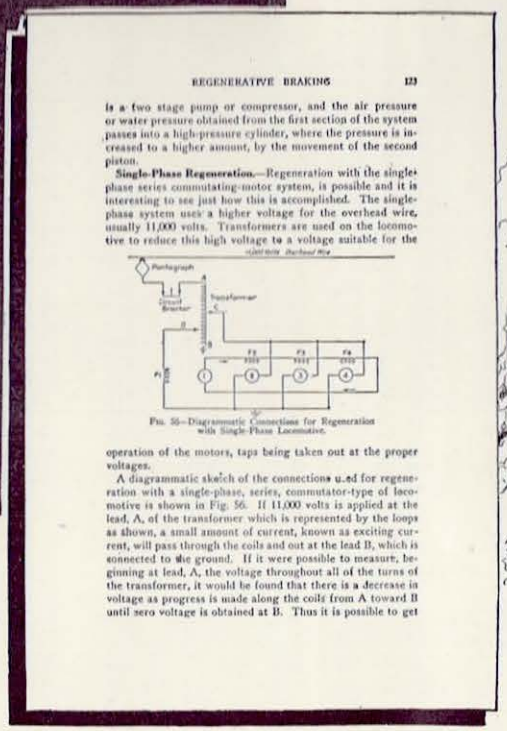


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Fig. 56—Diagrammatic Connections for Regeneration with Single-Phase Locomotive.

operation of the motors, taps being taken out at the proper voltages.

A diagrammatic sketch of the connections used for regeneration with a single-phase, series, commutator-type of locomotive is shown in Fig. 56. If 11,000 volts is applied at the lead, A, of the transformer which is represented by the loops as shown, a small amount of current, known as exciting current, will pass through the coils and out at the lead B, which is connected to the ground. If it were possible to measure, beginning at lead, A, the voltage throughout all of the turns of the transformer, it would be found that there is a decrease in voltage as progress is made along the coils from A toward B until zero voltage is obtained at B. Thus it is possible to get

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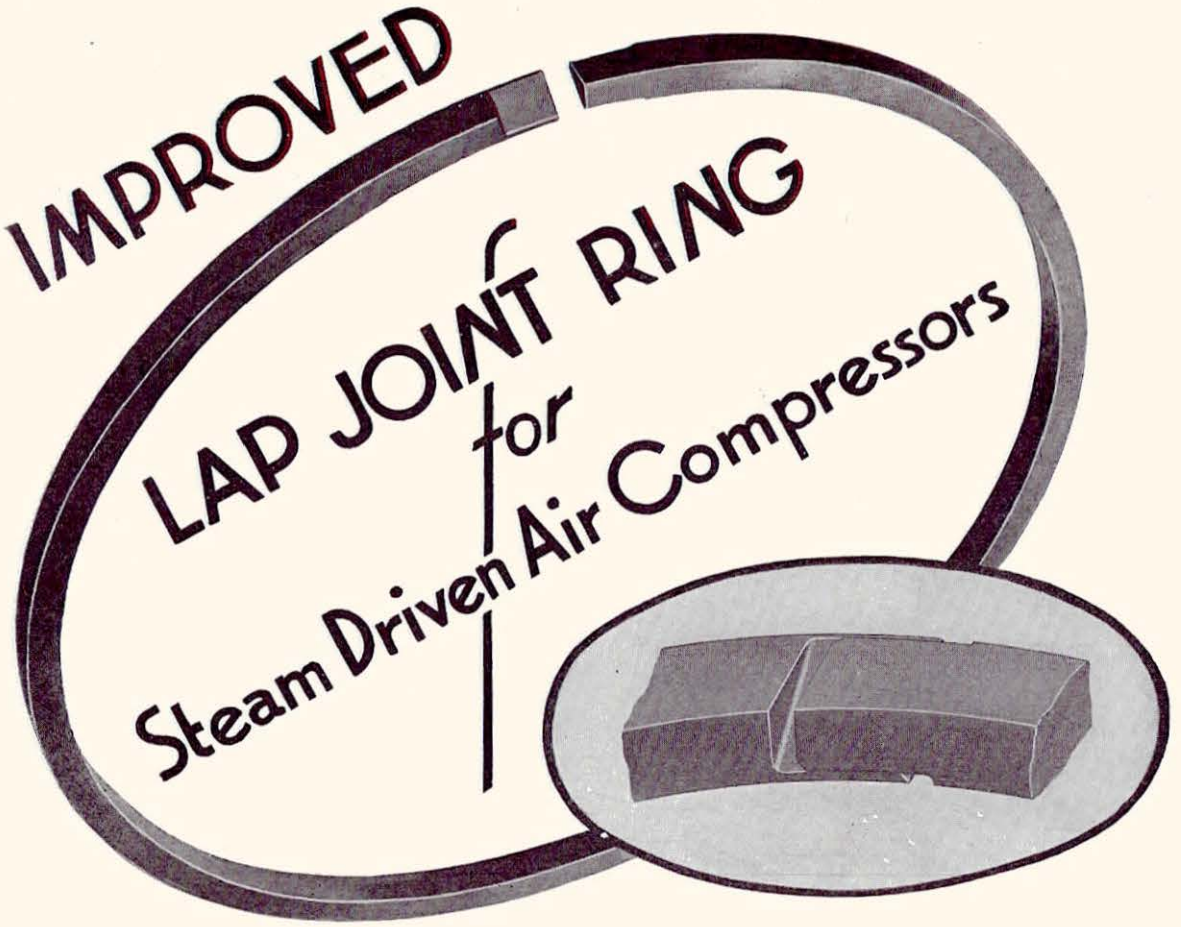

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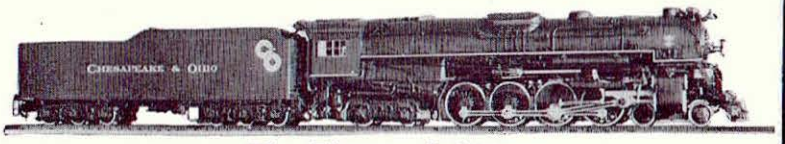
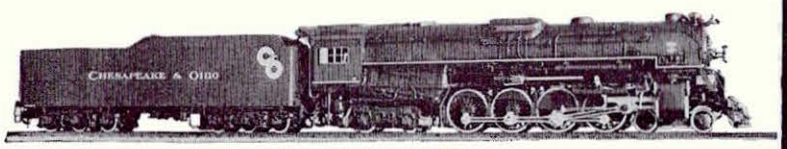


The Thomas Jefferson



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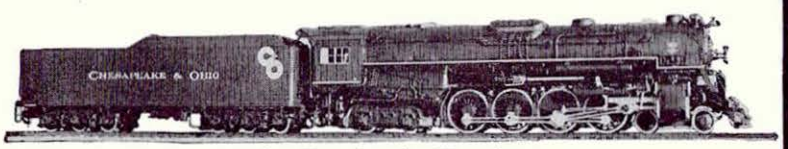
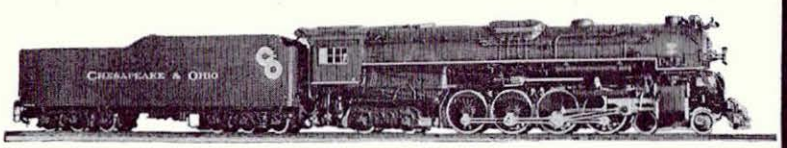


The Benjamin Harrison



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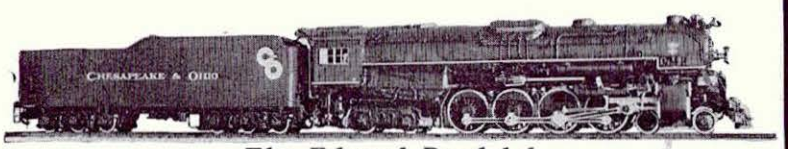

The Edward Randolph

The New C AND O Locomotives are FIREBAR Equipped

THE five new Greenbrier Type locomotives which develop the highest horsepower of any steam passenger locomotive are FIREBAR equipped.

More than 650 locomotives on the Chesapeake & Ohio are FIREBAR equipped.

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Muncie, Indiana

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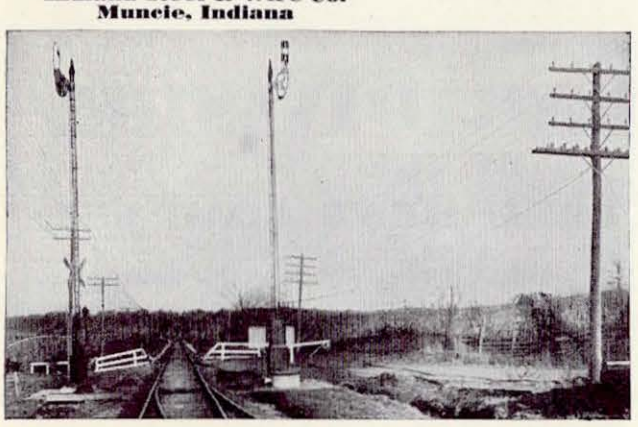
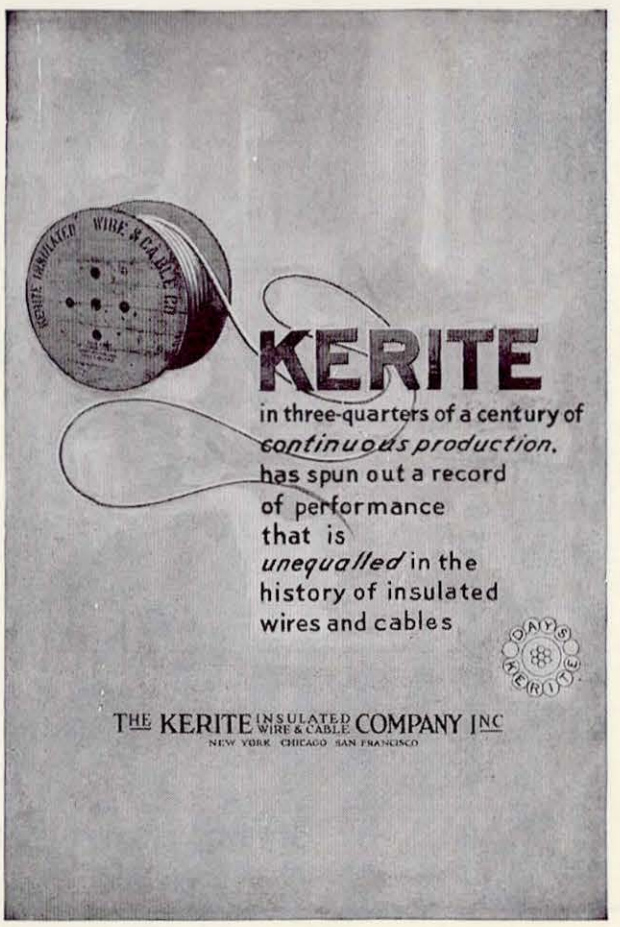
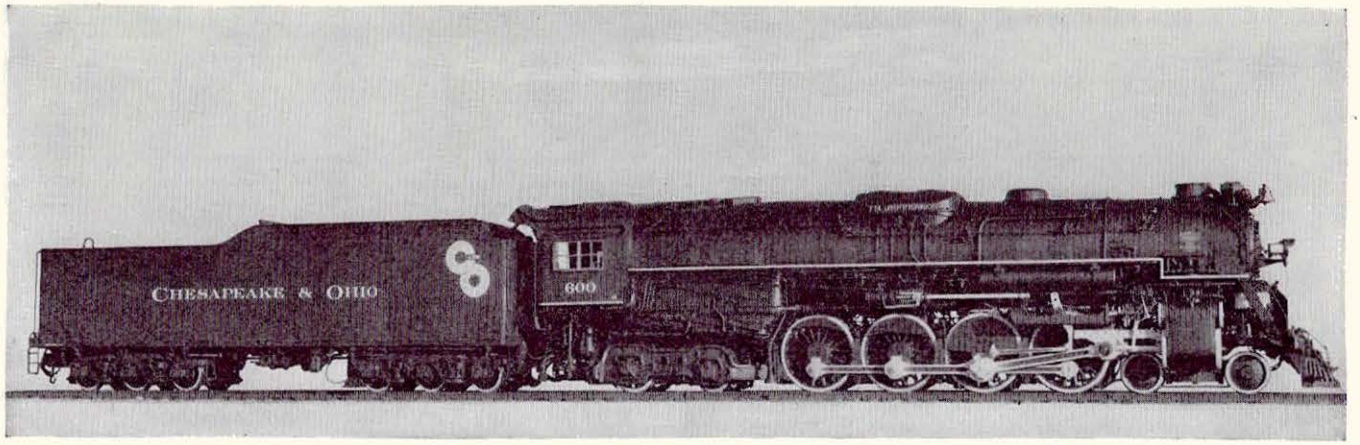
Steel Strand







C AND O

The five 4-8-4 type locomotives delivered by Lima Locomotive Works, Incorporated, in December, 1935 to the Chesapeake and Ohio and designated as the Greenbrier Type have unusually large combined heating surface and are capable of developing not less than 5,000 cylinder horsepower.

These Locomotives were designed for heavy through passenger train service on the main line over the Allegheny Mountains and Blue Ridge Mountains between Hinton, West Virginia, and Charlottesville, Virginia. All five of these locomotives are fired by Standard Stokers.

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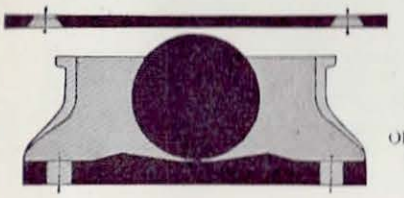

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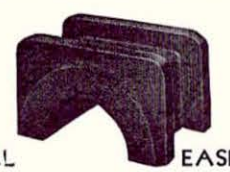

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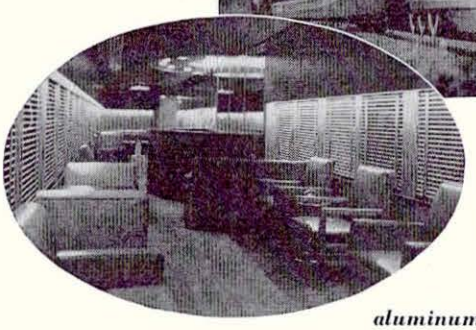
More Proofs

DEVILBISS

Spray-Painting for the New York Central's "MERCURY"

The "Mercury" painted inside and out with DeVilbiss Spray-Painting Equipment.



Interior decorations mostly in rich tones of brown and rust, contrasted with light tans, greens and blues. Silver aluminum trim throughout.

● The present trend is definitely toward modernization of railroad equipment. In keeping with that trend, is modernization of painting and painting methods. A striking example is found in the New York Central's paint shops at Beech Grove, Indiana. Here, in one of the most modern railroad paint shops in the country equipped with the latest DeVilbiss Canopy Exhaust System, the "Mercury" was painted. All painting, both exterior and interior, was done with DeVilbiss Spray-Painting Equipment.

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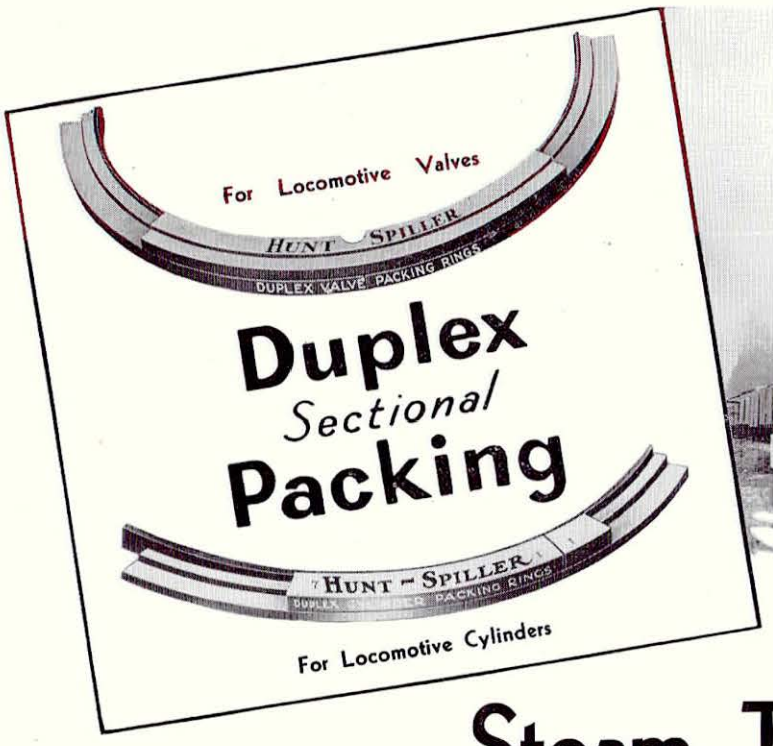

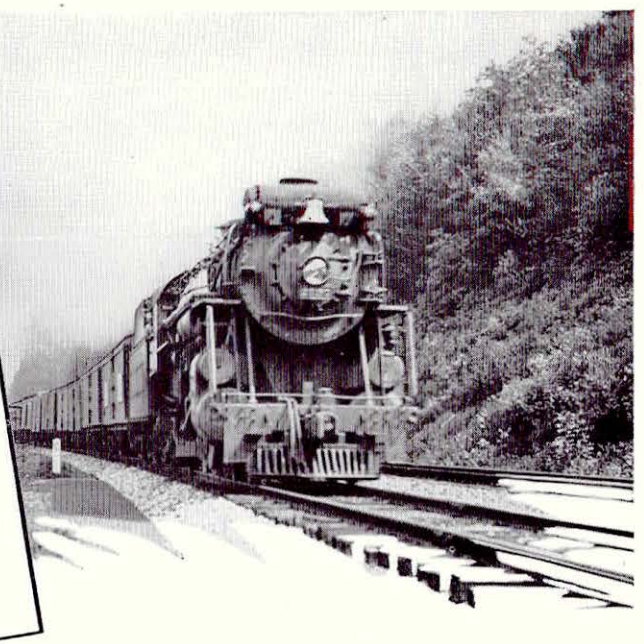

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